



LANCASHIRE COUNTY COUNCIL



ANNUAL REPORT

of the

COUNTY ANALYST

for

THE YEAR 1962

Printed by

F. Taylor & Co. (Blackpool) Ltd., Regent Road East, Blackpool. Tel. 28387/8.




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PUBLIC HEALTH AND HOUSING COMMITTEE

(1963)

The Chairman of the County Council :

COUNTY ALDERMAN SIR ALFRED BATES, M.C., D.L.

The Vice-Chairman of the County Council :

COUNTY ALDERMAN SIR ANDREW SMITH, C.B.E., J.P.

The Chairman of the Finance Committee :

COUNTY ALDERMAN H. LUMBY, C.B.E., J.P.

The Chairman of the Health Committee :

COUNTY ALDERMAN HARRY LORD, C.B.E., J.P.

Chairman of Committee :

COUNTY COUNCILLOR F. L. NEEP

Vice-Chairman :

COUNTY ALDERMAN J. W. THORLEY, J.P.

County Aldermen :

SIR THOMAS TOMLINSON, J.P.

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LANCASHIRE COUNTY LABORATORY

STAFF 1963

County Analyst :

G. H. WALKER, PH.D., B.SC., F.R.I.C.

Deputy County Analyst :

A. C. BUSHNELL, F.R.I.C.

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J. COTTAM, B.SC., F.R.I.C.

M. S. GREEN, B.SC., A.R.I.C., M.R.S.H.

Assistant Analysts :

J. L. WILLIAMS

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MISS C. M. WARE

R. BEE

MISS A. P. DINSDALE

Clerical Staff :

H. HIGGINSON, A.C.C.S.

J. H. THOMPSON

MISS O. THOMAS

MISS S. HARPLEY

Laboratory Attendants :

MRS. M. CLITHEROE

MRS. M. SAUNDERS (Part-time)

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT OF THE COUNTY ANALYST
FOR THE YEAR 1962.

To the Chairman and Members of the Lancashire County Council.

I have the honour to submit for your consideration my seventeenth Annual Report which deals with the work carried out in the County Laboratory during the year ended 31st December, 1962. The total number of analyses and tests carried out in this period was 14,846. In order to facilitate reference these have been grouped under the following headings :—

- Part I. Report on samples taken under the Food and Drugs Act, 1955. Page 9.
- Part II. Report on Heat-treated Milk Samples taken under the Milk (Special Designation) Regulations, 1960. Page 101.
- Part III. Report on samples taken under the Fertilisers and Feeding Stuffs Act, 1926. Page 106.
- Part IV. Report on Waters, Effluents, etc. Page 113.
- Part V. Radioactivity. Page 119.
- Part VI. Miscellaneous (including Atmospheric Pollution). Page 133.

The total number of samples from all sources examined during the year is the highest recorded for the laboratory. The number of samples examined for the County under the Food and Drugs Act and the Fertilisers and Feeding Stuffs Act (excluding, however, milk samples submitted for Phosphatase, Methylene Blue or Turbidity Tests) was 8,858. The number of Food and Drugs samples submitted by the 12 Autonomous Food and Drugs Authorities, for which your Analyst acts as Public Analyst, was 2,333.

The number of Food and Drugs samples (excluding appeal-to-cow samples) submitted by the County Sampling Officers during the year 1962 was 8,784 as against 8,352 during the previous year and 7,857 in the year 1960 ; the rate of samples per 1,000 of the population was 5·86 in the year under review, 5·57 in 1961 and 5·48 in 1960. The number of County Food and Drugs samples examined in 1962 was actually the highest for any year in the history of the laboratory.

The number of County Food and Drugs samples has, therefore, been maintained well above the level reached in 1947 (6,819). Prior to 1947, the highest figure was 5,263 in the year 1933. During the year the number of samples found to be adulterated or unsatisfactory was 334 ; this corresponds to an adulteration rate of 3·8 per cent., as against 4·9 per cent. in the year 1961, and 4·6 per cent. in the year 1960. Table 4 gives the percentage adulteration for the last 10 years and it will be seen that the figure for the year under review is the lowest in the table and there has been an appreciable drop over that period compared with the years 1941 to 1948 when the adulteration rate varied from 9·3 to 5·7 per cent. Viewed in the light of the figures for the last 10 years and for the period immediately preceding, the adulteration rate for the year 1962 cannot be regarded as unsatisfactory although it is higher than in some of the years immediately preceding the war when the percentage adulteration varied from 2·6 to 4·2.

In addition to Food and Drugs samples the County Sampling Officers submitted 1,708 samples of heat-treated milk for examination by the Phosphatase test, the Half-hour Methylene Blue test or by the Turbidity test as against 1,583 samples submitted in the previous year. Of these, nine failed to pass the Phosphatase test and eight samples failed to pass the statutory Methylene Blue test ; the corresponding figures for the year 1961, being four and sixteen respectively. All the 93 County Districts in the County Food and Drugs Area are now Specified Areas in which only designated milks may be sold. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows that an increased number of samples is being taken by County Sampling Officers for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests.

As usual nearly two-thirds of the Food and Drugs samples submitted by the County Sampling Officers consisted of samples of milk. Of 5,403 milk samples, 156 were found to be adulterated which represents an adulteration rate of 2·9 per cent. The corresponding figure for

the year 1961 was 3·5 per cent. and for the year 1960 it was also 3·5 per cent. The 156 unsatisfactory milk samples examined during the year included, in addition to milks deficient in fat or containing extraneous water, eleven samples found to contain foreign matter and twelve samples found to contain small amounts of penicillin or other antibiotic. Milk adulteration in the County of Lancaster has, in general, shown consistent and appreciable decreases since the year 1946. It is reasonable to assume that these decreases are in some measure due to the increased sampling which has occurred since that year.

The adulteration rate for samples other than milk was 5·3 per cent. which is 2·1 per cent. lower than that obtained in the year 1961 when the figure was 7·4 per cent. The adulteration rate for the last 10 years has varied from 3·8 to 7·4 per cent., the former figure in the years 1952 and 1953 and the latter in the year 1961. The commodities which showed a relatively high proportion of unsatisfactory samples and, therefore, contributed especially to the adulteration rate included sausages, (particularly sausages containing permitted preservative without declaration) samples of bread and other foods containing extraneous matter or insects and samples whose labels did not conform to the requirements of the Labelling of Food Order. An examination, however, of table 21 and the sections of the report concerned with the commodities just mentioned will bring to light the fact that many of the samples reported as unsatisfactory showed only slight irregularities in composition or minor infringements of labelling requirements.

Several new Statutory Regulations which affect the work of the Public Analyst were made during the year under review. Probably the most important of these are the Emulsifiers and Stabilisers in Food Regulations, 1962, and the Preservatives in Food Regulations, 1962. The former contains a list of the substances or classes of substances which are permitted as emulsifiers or stabilisers in food. The preservative regulations permit the presence of preservative in all foods which were allowed to contain preservative under the previous regulations, and, in addition, both the number of permitted preservatives and the list of specified foods allowed to contain preservative have been extended. Five Food Standards Committee reports were also published during the year under review. The reports on Lead and Arsenic limits in yeast and yeast products, mineral oil in food and dried milk review the appropriate existing regulations. The reports on hard, soft and cream cheeses and on canned meat, however, propose that entirely new regulations should be made controlling the composition and labelling of these products. Statutory Standards are recommended for the

fat and moisture contents of all the types of cheese covered by the report and it is suggested that all soft cheeses should be compulsorily labelled in order to prevent purchasers being misled as to their nature and composition. The report on canned meat in addition to making proposals as to composition and labelling also includes an appendix on sampling and analysis. All canned meat products are divided into fifteen categories each with a recommended minimum meat content; here again it is proposed that each product should bear a declaration on the label clearly indicating its category. Further details with regard to all the new regulations and Food Standards Committee reports are given in Part I of this report.

In Part I of the report will also be found information with regard to the presumptive standards of quality for milk, the special standard for the milk-fat content of Channel Islands milk, the proportions of the various special designation milks which were found to be adulterated, the proportion of milks which were found to be naturally poor in solid-not-fat, etc. Although the proportion of Channel Islands milk samples to samples of ordinary milk obtained in Lancashire is low compared to this proportion in counties in the South of England, nevertheless, the number of Channel Islands milk samples submitted to the County Laboratory is slowly increasing. During the year under review the number examined was 416 (361 County) and it is interesting to compare the averages for fat and solids-not-fat of the Channel Islands milk samples with the same averages for ordinary milk samples. Channel Islands milks showed an average of 4.79 per cent. milk-fat and 9.02 per cent. solids-not-fat whereas the averages for ordinary milks were 3.70 per cent. for milk fat and 8.61 per cent. for solids-not-fat.

During the year, 70 samples (34 County) were found to contravene the requirements of the Labelling of Food Order. The majority of these, as will be seen from the details given in table 21, were due to a failure to comply fully with the requirements of the order but a number of the more interesting samples are described in the section of the report which deals with this order. As in former years it will be noted that several samples, which were exempt from the requirement to declare a list of ingredients, voluntarily declared an incomplete list or one in which the ingredients were not in the correct order (i.e., the ingredient used in greatest amount should be declared first and so on). Such declarations can be misleading to a purchaser and your Analyst is of the opinion that a voluntary list should conform to all the requirement which would apply if the commodity came fully within the scope of the Order. It will be noted that three samples were found to contain permitted artificial colouring matters without declaration of their

presence and a sample of butter sweets, in connection with which there was a successful prosecution, was not only found to be deficient in butter but it also contained Rhodamine B, a coal tar colour which is not permitted in food. Four samples of cakes were sold under names which implied that they were made from butter or contained cream but upon analysis they were found to be either devoid of these ingredients or there had been partial substitution by other edible fats. A rather unusual sample submitted by an Autonomous Food and Drugs Authority consisted of white coffee obtained from a vending machine. This beverage was found to contain skimmed milk instead of milk and it had also not been correctly dispensed by the machine.

The composition of ice-cream has been again maintained at a satisfactory level and only two samples, of the 121 submitted by the County and Autonomous Authorities, did not comply with the requirements of the Food Standards (Ice-Cream) Regulations. With regard to ice lollies, the product of one manufacturer was found to contain excessive amounts of copper due to the use of untinned copper moulds. Several other commodities which contained rather excessive amounts of metals are mentioned in the section dealing with metals in food. Particular note should be made of a sample of home-made jam submitted by an Autonomous Food and Drugs Authority which contained excessive amounts of both lead and copper due to it having been made in a brass pan which was not in a clean condition.

As in former years, a relatively large number of samples was submitted as the result of complaints by members of the public that the commodities concerned contained insects or other extraneous matter. Altogether 70 samples (52 County) came under these headings and it will be seen from a perusal of the appropriate sections of the report that a number of successful prosecutions resulted. Probably the most unusual was the presence of caterpillars in black puddings shown to be due to the use of infested culinary herbs.

Of eighteen samples of Penicillin preparations examined, three were reported upon adversely. Two had been incorrectly dispensed and the third had lost a considerable proportion of its potency due to deterioration during storage. One sample of teething powders was found to contain calomel (mercurous chloride) although for nearly ten years the use of mercurials has been discontinued by manufacturers of teething powders because of danger to the health of infants. Reference should also be made to a sample, mentioned in Part VI of the report, which was submitted for analysis in a partly filled lime juice codial bottle. The sample was found to consist of 85 per cent. lime

juice cordial and 15 per cent. of a soapless detergent glass washing fluid. Some of the contents of the bottle had previously been served in a drink to a customer on licensed premises. A successful prosecution was instituted by an Autonomous Food and Drugs Authority under Section 2 of the Merchandise Marks Act, 1887, in respect of raw milk sold as pasteurised milk and another successful prosecution was instituted by the County under the Fertilisers and Feeding Stuffs Act in respect of a sample of cattle food which was found to be deficient in protein content.

The work on radioactivity, commenced in September, 1958, has been continued and is described in Part V of the report. In addition to the determinations which have previously been carried out on air, rain-water, tap-water, milk and other foods a number of school dinners have been examined during the year under review in order to obtain further information on the level of Strontium 90 in a mixed diet. Due to the series of Russian test explosions in the Autumn of 1961 and to a further series in the latter half of 1962 there was an increase in fallout in the year 1962 compared with previous years. The level of Strontium 90 deposited by rainfall was about 26 per cent. higher than in the year 1959 when the previous highest figures were obtained. The deposition in 1962 was, however, spread out more evenly throughout the year and did not reach quite as high a peak in the spring of the year as occurred in 1959. On the other hand, the average concentration of Strontium 90 in milk during 1962 was a little less than in the year 1959, due to the fact that the level in milk for the first four months of the year under review was quite low because cows were then feeding chiefly on fodder harvested before the commencement of the 1961 series of explosions. Appreciable amounts of Iodine 131 were detected in milk for some thirteen weeks following the Russian tests which commenced in August, 1962, but the maximum level found was lower than the level reached in the year 1961. The average concentration of Iodine 131 found over the thirteen weeks was only approximately one-tenth of the maximum concentration permissible over such a period.

It has already been mentioned that the total number of samples and the number of County Food and Drugs samples examined during the year under review are both higher than ever before and that there is a continuously increasing number of new regulations and proposals for regulations. All these circumstances are resulting in a steadily increasing burden of work and I welcome this opportunity of expressing to the Deputy County Analyst, Mr. A. C. Bushnell, and to the members of the staff, both analytical and clerical, my appreciation of their loyal support throughout the year. The willing co-operation of the

Sampling Officers, both of the County and of the Autonomous Food and Drugs Authorities, has also greatly facilitated the efficient running of the laboratory.

In conclusion, I wish to tender to the members of the County Council and to the County Medical Officer of Health my most grateful thanks for their continued encouragement and support and for their unfailing interest in the work of the laboratory.

I have the honour to be, Mr. Chairman, Ladies and Gentlemen,

Your obedient Servant,

GEO. H. WALKER,

County Analyst.

The County Laboratory,

County Hall,

Preston.

3rd July, 1963

TOTAL SAMPLES EXAMINED

During the year 1962, a total of 14,846 analyses and tests have been carried out in the County Laboratory. They are classified in the following table :—

Table 1

County Samples—

Food and Drugs Act (including 5,403 milks)	...	8,784
Appeal-to-Cow	... ..	22
Fertilisers and Feeding Stuffs Act, 1926	... ..	52
Food and Drugs Act samples (including two Appeals-to-Cow) from the following autonomous Food and Drugs Authorities—		
County Borough of Barrow-in-Furness	...	180
Borough of Chorley	... ..	87
Borough of Darwen	... ..	116
Urban District of Huyton-with-Roby...	...	247
City of Lancaster	... ..	141
Borough of Leigh	... ..	160
Borough of Middleton	... ..	128
Borough of Morecambe and Heysham	...	197
Urban District of Newton-le-Willows	...	46
County Borough of Preston	... ..	612
County Borough of Southport	... ..	283
County of Westmorland	... ..	136
	—	2,333
Fertilisers and Feeding Stuffs Act, 1926—		
Preston County Borough	... ..	12
Southport County Borough	... ..	7
County of Westmorland	... ..	16
Other Samples (from all sources including the County)—		
Potable Waters	... ..	122
Other Waters and Effluents	... ..	51
Miscellaneous	... ..	364
Milk Samples.—Phosphatase Tests	... ..	1,360
Milk Samples.—Methylene Blue Tests	... ..	1,376
Milk Samples.—Turbidity Tests	... ..	347
Total number examined	...	14,846*

*One hundred and twenty-three of these samples were examined for Radioactivity.

The total number of samples analysed in the year is compared with the total numbers similarly classified for the previous years 1912-1961, in table 2. It will be seen from the table that, since the year 1912, the grand total of samples examined amounts to 365,217.

Table 2

Total number of Samples examined during the years 1912 to 1962

Year	County Food and Drugs	Other Authorities Food and Drugs	County Appeal-to-cow Samples	Other Authorities Appeal-to-cow Samples	Fertilisers and Feeding Stuffs Act	Waters and Effluents	Miscellaneous and Departmental	Total Phosphate, Methylene Blue and Turbidity Tests	Total
1912-1950	185300	6733	2386	95	927	2604	3191	5201	206437
1951	8501	1337	28	9	54	196	203	1602	11930
1952	8622	1418	40	12	53	126	208	1745	12224
1953	8635	1345	50	11	59	112	237	1797	12246
1954	8089	1612	67	3	62	84	250	1949	12116
1955	8373	1983	49	5	76	118	288	2463	13355
1956	8215	2177	27	11	59	120	328	2508	13445
1957	8239	2007	77	2	80	121	387	2499	13412
1958	8225	2110	55	5	86	95	414	2445	13435
1959	8256	2394	18	3	87	129	445	2487	13819
1960	7857	2326	12	40	70	134	409	2610	13458
1961	8352	2270	21	36	78	158	449	3130	14494
1962	8784	2331	22	2	87	173	364	3083	14846
1912-1962	285448	30043	2852	234	1778	4170	7173	33519	365217

PART I.—SAMPLES TAKEN UNDER THE FOOD AND DRUGS ACT, 1955.

During the year under review the following new Regulations, which have a bearing on the work of the Public Analyst, were made :—

The Emulsifiers and Stabilisers in Food Regulations, 1962.

The Milk and Dairies (Emulsifiers and Stabilisers) Regulations, 1962.

The Food and Drugs (Legal Proceedings) Regulations, 1962.

The Milk and Dairies (Legal Proceedings) Regulations, 1962.

The Food Standards (Table Jellies) (Amendment and Revocation) Regulations, 1962.

The Preservatives in Food Regulations, 1962.

The Milk and Dairies (Preservatives) Regulations, 1962.

The Milk (Great Britain) Order, 1962.

In addition to the above list of new regulations the five reports of the Food Standards Committee listed below were also published by the Ministry of Agriculture, Fisheries and Food during the year 1962 :—

Lead and Arsenic limits in Yeast and Yeast Products.

Mineral Oil in Food.

Hard, soft and cream Cheeses.

Dried Milk.

Canned Meat.

The Emulsifiers and Stabilisers in Food Regulations came into operation on the 11th April, 1962, and they permit the use of some ten substances or classes of substances as emulsifiers and stabilisers in food. The list is considerably extended in practice by specifically excluding from the provisions of the regulations certain other commonly used substances such as alginates, edible gums, pectins, proteins, lecithin, quillaia, etc. The regulations prohibit the addition of emulsifiers or stabilisers to flour and only permit the addition of stearyl tartrate or partial glycerol esters to bread. Thickening substances other than cane or beet sugar are prohibited in cream. Special requirements are laid down with regard to the labelling and advertising of substances sold for use as emulsifiers and stabilisers in food. The Milk and Dairies (Emulsifiers and Stabilisers) Regulations, 1962, are parallel regulations made in respect of milk and they prohibit the addition of any emulsifiers or stabilisers to liquid whole or skimmed milk.

The purpose of the making of the Food and Drugs (Legal Proceedings) Regulations, 1962, and the Milk and Dairies (Legal Proceedings) Regulations, 1962, is to amend some 16 regulations made under the Food and Drugs Act, 1955, by specifically applying to the regulations certain sections of the Act relating to legal proceedings. In the past there has been some doubt as to whether certain sections of the Act relating to proceedings taken directly under the Act also applied to offences against regulations made under the Act. The regulations affected include the Food Standards (Ice-Cream) Regulations, the Arsenic in Food Regulations, the Milk and Dairies (Channel Islands and South Devon Milk) Regulations, etc., etc. The sections of the Food and Drugs Act concerned are :—sections 108 (relating to prosecutions), 110 (relating to evidence of analysis), 112 (which relates to analysis by the Government Chemist), 113 (relating to contraventions due to some other person other than the person charged), 115 (relating to the conditions of a warranty defence) and 116 (relating to offences in relation to warranties and certificates of analysis).

The Food Standards (Table Jellies) (Amendment and Revocation) Regulations came into operation on the 12th July, 1962, and they revoke as from the 12th July, 1963, the Food Standards (Table Jellies) Order, 1949, as amended. From that latter date standards of composition will not, therefore, apply to table jellies but they will then have to bear on the label a true statement of ingredients conforming to the requirements of the Labelling of Food Order. Between the two dates mentioned above the regulations permit that table jellies may either conform to the present standards of composition or bear a declaration of ingredients.

The Food Standards Committee Reports which preceded the making of the Preservatives in Food Regulations, 1962, were discussed in these Annual Reports for the years 1959 and 1961. It may be sufficient here, therefore, to give the following summary ; the number of permitted preservatives and the list of foods permitted to contain preservatives have been extended in comparison with those permitted in the former Public Health (Preservatives, etc. in Food) Regulations, 1925 ; where alternative preservatives are allowed in specified foods a mixture of these preservatives is now permitted ; food may contain up to five parts per million of formaldehyde if this is derived solely from resin bonded paper or from plastic food containers. The antibiotic nystatin is permitted on the skin of bananas and cheese, clotted cream or canned foods may contain nisin. There are one or two apparent anomalies in the new regulations ; for example, Pickles and Sauces are no longer permitted to contain benzoic acid although the presence of either methyl or propyl para-hydroxybenzoate is permitted in these products. Again, it will, in future, be a defence for a defendant charged with the presence of a non-permitted preservative in a particular food to prove that it was there solely due to its use in food storage as an acaricide, fungicide, insecticide or rodenticide or to its use under certain circumstances as a sprout inhibitor. The Milk and Dairies (Preservative) Regulations, 1962, specifically prohibit the addition of any preservative to milk.

The Milk (Great Britain) Order, 1962, is primarily a price control order but it is of interest to Public Analysts in that it defines " Channel Islands Milk " and " South Devon Milk."

The recommendations made in Food Standards Committee Reports published by the Ministry are not, of course, statutory and they may be amended in the light of trade and other representations before it is decided whether they should be made the basis of new legal standards. On the other hand the reports do represent the considered opinion of

the Food Standards Committee and are, therefore, extremely helpful to manufacturers, Public Analysts and others in deciding what should be regarded as good trade practice in regard to the composition of manufactured commodities. The five reports published during the year under review are very briefly described below.

The Report on Lead and Arsenic Limits in Yeast and Yeast Products reviews the statutory limits for these elements laid down in the arsenic in Food Regulations, 1959, as amended, and in the Lead in Food Regulations, 1961. The recommendation is made that no amendment should be made to the existing limits. It is, however, made clear that the Committee do not regard yeast tablets as "food" and that if any review of the existing limits for yeast tablets is needed then this is a matter for the appropriate Committee of the B.P.C.

The Report on Mineral Oil in Food reviews the provisions of the existing Mineral Oil in Food Order, 1949, as amended, and it is recommended that there should be no major amendment to the limits at present prescribed. It is suggested, however, that the sealing of eggs with mineral oil and the use of paraffin wax on the rind of whole pressed cheeses to prevent evaporation, cracking and surface mould growth, should both be specifically permitted. It is also recommended that any mineral oil or wax used in relation to food should conform to the appropriate standards of purity of the British Pharmacopoeia.

The Report on Hard, Soft and Cream Cheeses recommends that, in addition to the voluntary grading schemes for certain types of cheese, there should also be statutory standards for all the types of cheese covered by this report. The general standard recommended for varieties of hard cheese is 48 per cent. milk fat content calculated on the dry matter and not more than 40 per cent. water. Relaxations of the standard are, however, suggested for Cheese labelled as low fat or skimmed milk cheese and for the moisture content of certain types of cheese. It is also recommended that cheese of varieties not natural to the United Kingdom should conform to the standards applying in the country of origin. With regard to cream cheese it is suggested that "double cream cheese" should contain as sold not less than 65 per cent. by weight of milk fat and "cream cheese" not less than 45 per cent. Further, it should be an offence to label soft cheese in any manner which suggests that it is cream cheese or that it contains cream. Three grades of soft cheese are recommended "full fat" with not less than 20 per cent. milk fat and not more than 60 per cent. water; "medium fat" with 2 to 20 per cent. milk fat and not more than 70 per cent. water and "skimmed" with not more than 2 per cent. milk fat and not more

than 80 per cent. water. Curd cheese described as “ full fat ” should contain not less than 10 per cent. milk fat and not more than 80 per cent. water, while “ medium fat curd cheese ” should contain between 2 to 10 per cent. milk fat and not more than 80 per cent. water. Finally, it is suggested that all types of soft cheese should be compulsorily labelled with one of the definitions described above, in addition to any local geographical or other name such as “ Cottage Cheese,” in order to prevent the possibility of a customer being misled as to the composition of a cheese.

The report on Dried Milk reviews the Public Health (Dried Milk) Regulations, 1923, as amended, and it has taken into consideration the standards for dried milk adopted by the Food and Agriculture Organisation of the United Nations. The report recommends that full cream dried milk should contain not less than 26 per cent. milk fat and to avoid rapid deterioration it should contain not more than 5 per cent. moisture. Dried partially skimmed milk should contain not less than 1·5 per cent. milk fat and not more than 5 per cent. moisture; the minimum milk fat content being declared on the label. Special provisions are made for the labelling of half cream dried milk and this should contain between 14 to 16 per cent. milk fat. Dried Machine-Skimmed milk should contain less than 1·5 per cent. fat and the same maximum moisture content as the other description of dried milk. It is also recommended that all size containers of dried milk should comply with the labelling requirements except that the requirement applying to baby feeding should only apply to containers of 10 lb. gross weight or less. Finally, it is suggested that the present requirements as to instructions regarding dilution should be amended so as to assure that the resulting fluid will contain at least 9 per cent. milk solids other than fat.

The last report to be mentioned is that on Canned Meat. This is an excellent report which has clearly been the subject of a great deal of detailed consideration by the Food Standards Committee. Furthermore, the report includes suggested draft regulations and an appendix on sampling and analysis which should go far to refute any suggestion that regulations would be difficult to enforce. It is recommended that all canned meat products be classified under one or other of the following descriptions and standards :—

Canned meat—95 per cent.

Canned minced meat—90 per cent.

Canned meat with jelly—80 per cent.

Canned meat with gravy—75 per cent.

Canned meat with sauce—65 per cent.
 Canned meat with cereal—80 per cent.
 Meat loaf—65 per cent.
 Meat loaf with stuffing—50 per cent.
 Canned meat with vegetables—35 per cent.
 Canned meat with pastry—45 per cent.
 Canned meat puddings—35 per cent.
 Canned meat pies—25 per cent.
 Canned sausage—50 per cent.
 Canned pork sausage—65 per cent.
 Any other canned meat product—35 per cent.

In order to avoid any doubt in the minds of purchasers it is also recommended that a declaration should appear on the label or in an advertisement clearly indicating which of the above classifications applies to a product. Canned composite products with a very low meat content will still be permitted but such products, if containing less than 35 per cent. meat, must not be labelled with the meat mentioned first in the description and there must be no implication that meat is a major ingredient. Meat paste and canned soups are specifically excluded from the draft regulations and there is no mention of potted meat.

There would appear to be only a very few minor points which possibly require clarification or amendment in this very detailed report. It is mentioned that where products are canned in brine it is recommended that the brine should be ignored in calculating the percentage meat content. No specific reference is made to this, however, in the draft regulations themselves or to the method of carrying out the analysis and calculation in these circumstances. The presence of brine could also affect the declared net weight of the contents unless special provision is made for the method of declaration. While it is specifically recommended that the standard for canned meat with cereals (80 per cent.) should apply to canned hamburgers and similar products, no indication is, however, given of the appropriate classification for curried, braised or casserole meats. It seems difficult to justify the differences in meat content suggested for certain allied products, i.e., canned meat with pastry (45 per cent.), canned meat puddings (35 per cent.) and canned meat pies (25 per cent.). Furthermore, the figure of 35 per cent. for canned meat with vegetables does not appear to accord with the figure of 45 per cent. for canned meat with pastry. The figure of 35 per cent. for canned meat with vegetables is also appreciably lower than the figure of 45 per cent. for ready meals originally suggested in a now revoked commodity control order and it

it is also lower than the figure to which at least one section of the trade has been working. Finally, the figure of 80 per cent. for canned meat with jelly conflicts with the existing Code of Practice for chopped and minced poultry, etc., in jelly in containers of not more than 3 ounces for which a figure of not less than 70 per cent. meat has been agreed.

*Particulars of Samples of Food and Drugs submitted by County
Sampling Officers*

In table 3 there is a list of all the articles of food and drugs which were submitted during the year 1962, from the County of Lancaster together with the number of each kind and also the number found to be adulterated.

*Table 3
Samples examined under the Food and Drugs Act during 1962*

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Almonds, Ground		12	2	14		3		3
Ammoniated Mercury Ointment		11		11		2		2
Arrowroot		13		13				
Aspirin Tablets		32		32		1		1
Baby Foods		8		8				
Bacon		9	2	11				
Baking Powder		24	1	25				
Barley		27	1	28		2		2
Batter Mixture... ..		1		1				
Beans with Hamburgers, Canned		1		1				
Beef, Curried, Canned		1		1				
Beef Curry with Rice, Dehydrated		1		1				
Biscuits		5		5		1		1
Black Beer		1		1				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Black Puddings		1		1		1		1
Blancmange Powder		9	3	12		1		1
Borax		16		16				
Boric Acid		11		11				
Boric Acid Ointment		12		12		1		1
Boric Lint		20		20		4		4
Brandy	10			10				
Bread		30		30		13		13
Bread, Brown		4		4				
Bread Sauce Powder		1		1				
Butter		60	3	63				
Cake Coating		1		1				
Cake Decorations, Edible		11	1	12				
Cake Mixture, Sweetened		3		3				
Camphorated Oil		13		13		1		1
Cayenne Pepper, Ground		1		1				
Cereals (Porridge Oats)		1	3	4				
Cheese		25	1	26				
Cheese, Soft, with Shrimps		1		1		1		1
Chestnut Spread		1		1				
Chewing Gum		3		3		2		2
Chicken, Minced, in Jelly (Bottled and Canned)		3		3				
Chicken Fillets, Bottled		2		2		2		2
Chicken, Curried, Canned		2		2				
Chicken Spread		2		2				
Chicory and Coffee Extract Mixture, Dry		2		2				
Chocolate, Drinking		2		2				
Christmas Tree Decorations, Edible		6		6				
Chutney		5		5				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Cinnamon, Ground		10		10				
Cloves		4	1	4				
Cocoa		19		20				
Coconut, Dessicated		7		7		1		1
Coconut, Sweetened		1		1				
Codeine Tablets, Compound ...		14		14				
Cod Liver Oil		12		12				
Cod Liver Oil Capsules ...		1	4	1				
Coffee		16		20				
Coffee Extract, Dry		4		4				
Coffee and Chicory		4		4				
Coffee and Chicory Essence, Liquid, Sweetened		6		6				
Coffee and Chicory Extract Mixture, Dry		2		2				
Colouring Materials		3		3				
Condiment, Non- brewed ...		1	2	1		1		1
Cooking Fat		33		35				
Cooking oil		5	2	5				
Cornflour		15		17				
Cough Medicine		9		9				
Cough Sweets		6		6				
Cream, Sterilized		21		21				
Cream, Single		2		2				
Cream, Double		12		12				
Cream of Tartar		1		1				
Crumpets		1		1				
Curry Powder		9	3	9				
Custard Powder		15		18				
Dessert Mould		1		1				
Dripping		5		5				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Egg Croutons		1		1				
Egg Rusks		1		1				
Epsom Salts		18		18				
Figs, Compound Syrup of ...		11		11				
Fish Bottled		4		4				
Fish, Canned		49	2	51		1		1
Fish Cakes		7		7		2		2
Fish Fingers, Frozen		2		2		1		1
Fish, Fresh or Frozen ...		4		4				
Fish Paste		37		37		1		1
Fish Potted		8		8		1		1
Flavouring Materials		21		21			1	
Flour		33	9	42		3		4
Flour, Self-raising		43	3	46				
Flour Confectionery		54		54		3		3
Fruit, Bottled		4		4		1		1
Fruit, Canned		33	2	35		5		5
Fruit, Dried		80	17	97		5	1	6
Fruit, Fresh (Oranges, Apples, etc.)		48		48				
Fruit Curd		30	1	31		1		1
Fruit Juice, Canned		2		2				
Fruit, Stewed (Plums) ...		1		1				
Fruit Malt Loaf		1		1				
Gelatine		28		28				
Gelatine, Flavoured			1	1				
Gin	19			19				
Ginger, Ground		7	1	8				
Glauber's Salt		9		9		3		3
Glucose (Dextrose Monohydrate)		1		1				
Glucose Tablets		3		3				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Glycerin... ..		14		14		2		2
Golden Raising Powder ...		10		10				
Gravy Browning		23		23		2		2
Gravy Powder		3		3				
Gravy Salt		2		2				
Haggis, Scotch, Canned ...		1		1				
Headache Powders		12		12				
Headache Tablets		2		2				
Health Salts		12		12				
Herbs, Dried, Culinary ...		15		15		1		1
Honey		18		18				
Horseradish Sauce		1		1				
Hypophosphites, Compound Syrup of		5		5				
Ice-Cream	1	67		68		2		2
Ice-Cream, Dairy		15		15				
Ice-Cream, Cold Mix		1		1				
Ice-Lollies		24		24		1		1
Iodine, Tincture of		14		14				
Iodine Ointment		4		4				
Jam		19	5	24		1		1
Jelly, Table		51	5	56				
Junket Tablets		1		1				
Lard		46	3	49				
Laxative Tablets		14		14				
Laxative Chewing Gum ...		1		1				
Malt Extract with Cod Liver Oil		10		10		2		2
Malt Extract and Halibut Liver Oil		1		1				
Malt Extract and Vitamin Compound		1		1				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Malt, Milk and Cocoa Beverages		12		12				
Margarine		37	10	47				
Marmalade		4	2	6		1		1
Marzipan		1		1				
Meat, Canned		32	4	36		8		8
Meat Paste		21		21				
Meat Pies		5		5		1		1
Meat, Potted		10		10		2		2
Meat Tenderiser		1		1				
Meat and Vegetables, Canned...		7		7		1		1
Milk	2909	2216	278	5403	94	53	9	156
Milk, Channel Islands ...	246	115		361	5	1		6
Milk, Condensed, Full Cream, Unsweetened		8		8				
Milk, Condensed, Special Full Cream, Sweetened		6		6				
Milk, Condensed, Skimmed Sweetened		6		6				
Milk, Dried, Full Cream ...		7	1	8				
Milk, Dried, Skimmed ...		1	5	6				
Milk, Dried, Skimmed with non-milk fat		3		3				
Milk Food Dried, Modified ...		2		2				
Milk and Malt Beverage ...		3		3				
Milk Shake Syrup		4		4				
Mincemeat		11	1	12				
Mint, Dried		3		3				
Mint Jelly		1		1				
Mint Sauce		2		2				
Mustard Compound		8		8				
Mustard Flour		1		1				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Mustard Paste		1		1				
Nutmeg, Ground		7	1	8				
Nuts		2		2				
Oatmeal		26	2	28				
Olive Oil		18		18				
Olives, Stuffed		5		5				
Pancake and Yorkshire Pudding Mixture		2		2				
Paprika			1	1				
Paraffin, Liquid		17		17				
Paraffin, Liquid Emulsions ...		6		6				
Parrish's Chemical Food ...		7		7		2		2
Parsley Sauce Mixture ...		1		1				
Pastry Mixture		4		4				
Peanut Butter		2		2				
Pectin, Fruit, Liquid ...		1		1				
Penicillin Tablets and Lozenges		18		18		3		3
Pepper, White		27	1	28				
Pickles		58		58		6		6
Pie Filling		2		2				
Potato Cakes		1		1		1		1
Potato Crisps		1		1				
Potato Puffs		1		1				
Prawns, Curried, Canned ...		1		1				
Pudding, Canned		1		1				
Pudding, Christmas, etc. ...		26		26				
Pudding Mixture, Sweetened ...		5		5				
Pudding Mixture, Unsweetened		2	1	3				
Quinine, Ammoniated Tincture of		12		12		5		5

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Rennet, Essence of	12	1		1				
Rice		7	4	11				
Rice, Ground		1	1	2				
Rum				12				
Saccharin Tablets		21		21				
Sago		12	3	15				
Salad Cream and Salad Dressing		20	1	21				
Salt		1		1				
Sandwich (Buttered Bread with Lemon Cheese) ...		1		1		1		1
Sauce		37		37				
Sausages, Pork		59	3	62		19	2	21
Beef	1	48	1	50	1	11	1	13
Canned		4		4				
Sausage Meat		1		1				
Sausage Rolls		2		2				
Seidlitz Powders		7		7		4		4
Seidlitz Powders, Double Strength		3		3		1		1
Seidlitz Powders, Extra Strong		1		1				
Semolina		12	2	14		1		1
Slimmers Sugar		3		3				
Sodium Bicarbonate		25		25				
Soft drink, to be diluted ...		21		21				
Mineral Water ...		42		42		2		2
Orange Drinks ...		6		6		2		2
Ginger Beer Canned		1		1				
Soft Drink Powder and Crystals		4		4				
Soup, Canned		29	2	31		2		2
Soup Cubes		3		3				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Soup Mixture, Dry		2		2		1		1
Soup Powder		4		4				
Soup, re-constituted from soup powder		1		1		1		1
Spaghetti Dinner		1		1				
Spice, Mixed Ground		17	1	18				
Spice, Pickling		1		1				
Sponge Cake and Sponge Pudding Mixture, Sweetened		3		3				
Spread, Chocolate		1		1				
Stuffing (Sage and Onion) ...		3		3				
Suet, Shredded		12	2	14		1		1
Sugar		28	4	32		1		1
Sugar, Demerara		7	1	8				
Sugar, Icing		7	1	8				
Sugar Free Beverage		1		1				
Sweetmeats		6		6		1		1
Sweets (including chocolates and sweets containing Butter)	1	64	1	66	1	5		6
Syrup		9		9				
Table Creams		1		1				
Tapioca		17	1	18				
Tea		50	6	56				
Tea Bags		1		1				
Teething Powders		9		9		1		1
Throat Lozenges and Tablets		20		20				
Tomatoes, Fresh		1		1				
Tomato Juice, canned		2	1	3			1	1
Tomato Puree, Canned		2	1	3				
Travel Sickness Tablets		6		6				
Treacle and Molasses		10		10				
Trifle, Canned		1		1				

Table 3—continued.

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Trifle Pack		1		1				
Vegetables, Canned		3	1	4				
Vegetables, Dehydrated ...		6	2	8		1		1
Vegetables, Dried (peas, etc.)		32	5	37		1	2	3
Vegetables, Fresh		16		16				
Vegetable Juice, Canned ...		2		2				
Vermicelli		1		1				
Vinegar		29	1	30				
Vinegar, Distilled		2		2				
Vitamin Tablets		11		11				
Whey Butter		1		1				
Whisky	31			31				
Wine (British Sherry, British Ruby, etc.)		17		17		1		1
Yeast, Dried			1	1				
Yeast Tablets		1		1				
Zinc and Castor Oil Cream, B.P.		1		1				
Totals... ..	3230	5122	432	8784	101	216	17	334

The Number of Commodities

The variety of commodities on sale is now very large, and this is reflected in the number of different articles of which samples have been taken and submitted for analysis. Two hundred and fifty eight different commodities consisting of food and drugs were examined during the year.

In order to obtain adequate sampling of the common articles of food it is the practice to issue quarterly lists of samples which assist the sampling officers to correlate their samples one with another and at the same time ensure that each area is satisfactorily sampled in respect of any particular commodity. Due to the desirability of allowing considerable latitude in the sampling of other articles where this may be indicated in

the public interest, the variety of samples actually examined is considerably increased by the inclusion of commodities in less common demand.

Total Adulteration

During the year under review, 8,784 samples of food and drugs were submitted for examination under the Act, and of these 334 were reported upon adversely; the total adulteration was, therefore, 3·8 per cent. This is lower than the percentage of adulteration for the previous year (1961) when the figure was 4·9 per cent.

In table 4 the percentages of adulteration are given for the past ten years. It will be seen that during this period the lowest figure is 3·8 which was reached during the year under review and that the average figure is 4·6 per cent. In general, the adulteration rate during and subsequent to the war was considerably greater than that found in preceding years. The figure for the year under review cannot be regarded as unsatisfactory when compared with the figures for the last ten years, and it also falls within the range of the adulteration rate during the ten years 1929–1938 which preceded the war when the percentage adulteration varied from as little as 2·6 to 4·2.

Table 4

Percentage of Adulteration of County Samples of food and Drugs, 1953–1962.

Year				Total No. of Samples	No. of Adulterated Samples	Percentage of Adulteration
1953	...	...	...	8,635	386	4·5
1954	...	...	...	8,089	417	5·1
1955	...	...	...	8,373	413	4·9
1956	...	...	...	8,215	340	4·1
1957	...	...	...	8,239	349	4·2
1958	...	...	...	8,225	405	4·9
1959	...	...	...	8,256	373	4·5
1960	...	...	...	7,857	361	4·6
1961	...	...	...	8,352	414	4·9
1962	...	...	...	8,784	334	3·8
1953–1962	...	...	...	83,025	3,792	4·6

Analysis of County Food and Drug Samples

Table 5 gives the percentage of adulteration over the last ten years side by side with the various types of samples and with the number of samples taken per 100,000 of the population. The total number of samples and the number of samples per 100,000 of the population for the year under review have been well maintained at the level reached during the year 1947 (6,819 and 505 respectively) and the figures for all subsequent years are much higher than the corresponding figures for any of the previous years in the history of the County Laboratory.

Table 5

Year	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
Percentage of Adulteration ...	4·5	5·1	4·9	4·1	4·2	4·9	4·5	4·6	4·9	3·8
Total Samples ...	8,635	8,089	8,373	8,215	8,239	8,225	8,256	7,857	8,352	8,784
Formal Samples	3,220	2,817	3,300	3,474	3,331	3,337	3,321	3,012	2,995	3,230
Informal Samples	4,761	4,844	4,744	4,404	4,589	4,568	4,627	4,589	5,025	5,122
Private Samples	654	428	329	337	319	320	308	256	332	432
Number of Samples per 100,000 of the population	598	593	613	594	588	581	576	548	557	586

Total Adulteration : the County compared with other Areas

Table 6 gives the percentage of adulteration for the year 1962 for certain other Food and Drugs Authorities whose figures were available at the time of writing. I am indebted to the Public Analysts of the various districts for the information included in this table and also for the figures included in tables 13 and 17. It will be seen that the figure for the County of Lancaster, *viz*, 3·8 per cent. is a little lower than the average (4·0 per cent.) for the Authorities mentioned. The range of adulteration for the areas included in the table varied from 8·2 to 1·1 per cent.

Table 6
Total Adulteration, 1962. Various Areas.

Area	No. of Samples	Percent. of Adult.	Area	No. of Samples	Percent. of Adult.
Durham, County ...	3,504	4·5	Bristol	3,585	2·0
Kent, County ...	5,081	7·1	Leeds... ..	3,332	2·6
Somersetshire, County ...	3,660	5·4	Leicester	2,614	3·0

Table 6—continued.

Area	No. of Samples	Per cent. of Adult.	Area	No. of Samples	Per cent. of Adult.
Staffordshire, County ...	5,634	2·8	Liverpool	4,178	4·4
Surrey, County ...	857	3·1	Manchester	2,963	2·6
Worcestershire, County ...	6,827	8·2	Portsmouth	1,824	2·7
Birmingham ...	5,731	1·1	Salford	1,032	6·5
			Southampton ...	640	3·9

Adulteration in County Districts, etc.

There are 93 Districts shown in the Area of the County Food and Drugs authority for the year under review.

Table 7 shows the number of samples taken and the number of adulterated samples in each of the 93 districts together with those relating to 12 autonomous areas. An examination of the table will show that adulteration was nil in 15 of the County Districts as against nil in 14 districts for the year 1961. None of the autonomous areas showed a total freedom from adulteration.

Table 7

Adulteration in the County Districts and in the Areas of 12 Autonomous Food and Drugs Authorities during the year, 1962.

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Abram U.D.C.	12	2	15	0	27	2
Adlington U.D.C.	16	0	31	1	47	1
Ashton-in-Makerfield U.D.C. ...	46	2	37	1	83	3
Aspull U.D.C.	6	0	20	0	26	0
Atherton U.D.C.	59	1	42	1	101	2
Audenshaw	45	1	35	5	80	6
Bacup Borough	100	1	37	1	137	2
Barrowford U.D.C.	15	0	10	2	25	2
Billinge and Winstanley U.D.C.	11	0	14	1	25	1
Blackburn R.D.C....	57	1	27	0	84	1

Table 7—continued.

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Blackrod U.D.C.	11	1	11	0	22	1
Brierfield U.D.C.	22	2	15	1	37	3
Burnley R.D.C.	62	5	25	1	87	6
Carnforth U.D.C.	18	0	11	1	29	1
Chadderton U.D.C.	111	0	69	5	180	5
Chorley R.D.C.	146	8	62	1	208	9
Church U.D.C.	15	0	18	1	33	1
Clayton-le-Moors U.D.C. ...	22	0	9	0	31	0
Clitheroe Borough	37	0	20	0	57	0
Clitheroe R.D.C.	47	1	17	0	64	1
Crompton U.D.C.	51	2	33	1	84	3
Dalton-in-Furness U.D.C. ...	44	1	33	1	77	2
Denton U.D.C.	106	6	58	3	164	9
Droylsden U.D.C.... ...	84	3	57	4	141	7
Failsworth U.D.C.	53	0	47	3	100	3
Farnworth Borough	115	4	54	7	169	11
Fleetwood Borough	74	1	74	2	148	3
Formby U.D.C.	41	2	20	0	61	2
Fulwood U.D.C.	65	7	43	1	108	8
Fylde R.D.C.	52	7	37	0	89	7
Garstang R.D.C.	59	0	37	4	96	4
Golborne U.D.C.	67	0	18	0	85	0
Grange U.D.C.	13	0	21	0	34	0
Great Harwood U.D.C.	36	2	19	0	55	2
Haslingden Borough	47	1	26	0	73	1
Haydock U.D.C.	27	0	26	1	53	1
Heywood Borough	84	1	42	1	126	2
Hindley U.D.C.	51	0	48	2	99	2
Horwich U.D.C.	32	1	32	1	64	2
Ince-in-Makerfield U.D.C. ...	74	0	14	0	88	0

Table 7—continued.

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Irlam U.D.C.	39	0	47	3	86	3
Kearsley U.D.C.	29	1	21	2	50	3
Kirkby U.D.C.	171	2	93	6	264	8
Kirkham U.D.C.	34	1	14	1	48	2
Lancaster R.D.C.	74	2	50	3	124	5
Lees U.D.C.	23	0	12	0	35	0
Leyland U.D.C.	47	0	49	5	96	5
Litherland U.D.C.	103	2	35	2	138	4
Little Lever U.D.C.	36	1	14	0	50	1
Littleborough U.D.C.	43	0	18	1	61	1
Longridge U.D.C.... ..	13	0	14	2	27	2
Lunesdale R.D.C.... ..	44	3	26	2	70	5
Lytham St. Annes Borough ...	94	6	89	4	183	10
Milnrow U.D.C.	37	2	13	1	50	3
Mossley Borough	35	1	19	0	54	1
North Lonsdale R.D.C.	149	13	63	1	212	14
Nelson Borough	87	2	78	4	165	6
Ormskirk U.D.C.	57	0	63	3	120	3
Orrell U.D.C.	27	0	15	0	42	0
Oswaldtwistle U.D.C.	76	1	23	1	99	2
Padiham U.D.C.	28	0	23	2	51	2
Poulton-le-Fylde U.D.C. ...	39	2	28	1	67	3
Preesall U.D.C.	8	0	10	0	18	0
Prescot U.D.C.	31	0	34	0	65	0
Preston R.D.C.	144	4	88	3	232	7
Prestwich Borough	141	5	80	12	221	17
Radcliffe Borough	85	0	63	5	148	5
Rainford U.D.C.	10	0	17	0	27	0
Ramsbottom U.D.C.	52	1	41	2	93	3
Rawtenstall Borough	78	1	42	6	120	7

Table 7—continued.

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Rishton U.D.C.	17	0	9	0	26	0
Royton U.D.C.	65	1	34	5	99	6
Skelmersdale U.D.C.	13	0	17	0	30	0
Standish-with-Langtree U.D.C.	20	0	18	0	38	0
Thornton Cleveleys U.D.C. ...	61	1	46	1	107	2
Tottington U.D.C.	33	0	17	1	50	1
Trawden U.D.C.	13	1	12	2	25	3
Turton U.D.C.	49	1	36	0	85	1
Tyldesley U.D.C.	45	0	42	2	87	2
Ulverston U.D.C.	31	2	28	5	59	7
Upholland U.D.C.	21	0	19	1	40	1
Urmston U.D.C.	113	1	110	8	223	9
Walton-le-Dale U.D.C.	109	1	50	5	159	6
Wardle U.D.C.	17	0	8	1	25	1
Warrington R.D.C.	119	0	24	2	143	2
West Lancashire R.D.C. ...	115	4	149	4	264	8
Westhoughton U.D.C.	44	0	39	2	83	2
Whiston R.D.C.	128	0	84	1	212	1
Whitefield U.D.C.	39	3	45	3	84	6
Whitworth U.D.C.	38	1	15	2	53	3
Wigan R.D.C.	85	2	32	3	117	5
Withnell U.D.C.	13	0	5	0	18	0
Worsley U.D.C.	116	0	96	5	212	5
Miscellaneous	232	25	0	0	232	25
Total County Districts	5,403	156	3,381	178	8,784	334
Twelve Autonomous Food and Drugs Authorities	1,146	53	1,185	106	2,331	159
Total—All Sources	6,549	209	4,566	284	11,115	493

Adulteration of Milk in the County

The number of milks submitted under the Food and Drugs Act during the year was 5,403 and of these 156 were reported against ; the amount of adulteration was, therefore 2·9 per cent. This figure, as will be seen from table 8 is lower than the average for the last ten years and is in fact, the lowest shown in the table.

Table 8
Percentage of Adulteration of Milk Samples, 1953–1962

Year				No. of Samples	No. of. Adulterated Samples	Percentage of Adulteration
1953	...	...	...	5,872	281	4·8
1954	...	...	...	5,115	287	5·6
1955	...	...	...	5,637	273	4·8
1956	...	...	...	5,497	203	3·7
1957	...	...	...	5,411	190	3·5
1958	...	...	...	5,385	231	4·3
1959	...	...	...	5,294	198	3·7
1960	...	...	...	5,051	178	3·5
1961	...	...	...	5,201	180	3·5
1962	...	...	...	5,403	156	2·9
Total ...				53,866	2,177	4·0

The Adulteration of Milk in the County for each month of the year

In table 9 will be found the figures for the number of milk samples submitted by County Sampling Officers during each month of the year together with the number adulterated and the percentage adulteration. In general the percentage adulteration usually increases during late winter and decreases in the autumn. The increasing adulteration of milk noted during the winter and first half of the year may be due to two factors : (a) the poorer quality of milk towards the end of the winter enables cases of slight adulteration to be detected more readily and, (b) the scarcity of milk in the winter may, in some instances, be an incentive to adulteration.

Table 9
Milk—Monthly Adulteration, 1962.

Month	Number of Samples	Number Adulterated	Percentage of Adulteration
January	602	15	2.5
February	459	16	3.5
March	407	17	4.2
April	418	10	2.4
May	632	28	4.4
June	248	19	7.7
July	541	9	1.7
August	471	9	1.9
September	368	9	2.4
October	611	7	1.1
November	461	9	1.9
December	185	8	4.3
Total	5,403	156	2.9

In the following table will be found particulars of the various types of adulteration and the number of samples under each heading :—

Table 10

			Per cent.
Milks deficient in fat only	64	or	1.19
Milks containing added water only	58	or	1.08
Milks deficient in fat and containing added water	11	or	0.20
Milks deficient in fat and containing Penicillin	2	or	0.04
Milks containing Penicillin	10	or	0.19
Milks containing foreign matter, etc.	11	or	0.20
Milks containing preservatives	Nil	or	Nil
Milks containing colouring matter	Nil	or	Nil
	156	or	2.90
Milks containing more than 3 per cent. added water	22	or	0.41
Milks 10 per cent. or more deficient in fat ...	19	or	0.35

Alternatively the milk adulteration can be expressed in terms of the adulteration of the various grades of milk as shown in the following table.

Table 11

Grade of Milk	Number of Samples	Number Adulterated	Percentage of Adulteration
Pasteurised	1,323	20	1.51
Tuberculin Tested (Pasteurised)	1,228	6	0.49
Sterilised	631	8	1.27
Tuberculin Tested	2,059	108	5.24
†Raw	162	14	8.64
*Channel Islands (all grades)	361	6	1.66

† Will include raw designated milks not submitted as such.

* The figures for Channel Islands Milks are included here for completeness but for all other purposes in this report they are considered separately as they come under Regulations of their own, see page 37.

It will be noted from table 11 that all the heat treated milks show a lower rate of adulteration than the types of raw milk. This is primarily because heat treated milks are normally bulked before processing and irregularities in individual churns or consignments may thereby be obscured. As against this the high adulteration rate for raw undesignated milks is weighted by the selective sampling of a number of milks, taken on delivery to processing dairies, which were the subject of complaint by the dairy managements.

“ Serious ” Milk Adulteration

A study of table 10 reveals that 0.76 per cent. or just over one-quarter of the total milk adulteration may be considered “ serious.” This figure includes 22 samples which contained added water and 19 samples which were deficient in fat. A number of these seriously adulterated samples were taken informally and could not, therefore, be the subject of prosecutions. In several other instances corresponding appeal-to-cow samples of poor quality were submitted by the Sampling Officers. Prosecutions were recommended, however, in respect of twenty-one samples. In addition, one other sample, which was the subject of a prosecution, was found to contain extraneous matter.

In table 12 are given details in regard to the adulterated milk samples, submitted by County Sampling Officers, which were the subject of legal proceedings, together with the results of the prosecutions.

Table 12
Milk Prosecutions, 1962.

Number of Sample	Nature of Adulteration or Irregularity	Observations
S.10	Contained three fragments of broken glass—weighing in all 0.091 gramme.	Sections 2 and 113 (3) Food and Drugs Act, 1955. Fined £15 and £7.7.0 costs.
C.7863	Deficient 12.7 per cent. solids-not-fat ; freezing point indicated 6.7 per cent. extraneous water.	Same vendor. Section 32 (3) Food and Drugs Act, 1955. Fined £21 and £15.15.0 costs.
C.7864	Deficient 1.0 per cent. fat and 7.4 per cent. solids-not-fat ; freezing point indicated 3.3 per cent. extraneous water.	
C.7865	Deficient 6.2 per cent. solids-not-fat ; freezing point indicated 3.0 per cent. extraneous water.	
C.7866	Deficient 11.6 per cent. fat and 10.9 per cent. solids-not-fat ; freezing point indicated 5.9 per cent. extraneous water.	
C.7867	Deficient 9.5 per cent. solids-not-fat ; freezing point indicated 3.8 per cent. extraneous water.	
C.7868	Deficient 5.8 per cent. solids-not-fat ; freezing point indicated 2.5 per cent. extraneous water.	
C.7869	Deficient 1.6 per cent. fat and 10.7 per cent. solids-not-fat ; freezing point indicated 3.7 per cent. extraneous water.	
C.8087	Deficient 8.4 per cent. solids-not-fat : freezing point indicated 7.5 per cent. extraneous water.	Same vendor. Section 32 (3) Food and Drugs Act, 1955. Fined £4 and £7.7.0 costs.
C.8088	Deficient 2.0 per cent. solids-not-fat ; freezing point indicated 1.6 per cent. extraneous water.	
C.8089	Deficient 4.7 per cent. solids-not-fat ; freezing point indicated 1.8 per cent. extraneous water.	
C.8090	Deficient 11.6 per cent. solids-not-fat ; freezing point indicated 10.9 per cent. extraneous water.	
C.8142	Deficient 10.0 per cent. fat and 8.9 per cent. solids-not-fat ; freezing point indicated 6.9 per cent. extraneous water.	Section 32 (3) Food and Drugs Act, 1955. Fined £5 and £7.7.0 costs.
C.8240	Deficient 9.4 per cent. solids-not-fat : freezing point indicated 7.2 per cent. extraneous water.	Section 2 Food and Drugs Act, 1955. Fined £5 and £13.13.0 costs.

Table 12—continued.

Number of Sample	Nature of Adulteration or Irregularity	Observations
E.9809	Deficient 8·5 per cent. solids-not-fat ; freezing point indicated 9·2 per cent. extraneous water.	Section 32 (3) Food and Drugs Act, 1955. Fined £2 and £7.7.0 costs.
C.8474	Deficient 31·6 per cent. fat and 2·7 per cent. solids-not-fat ; freezing point indicated 0·6 per cent. extraneous water.	Section 2 Food and Drugs Act, 1955. Fined £10.
N.6166	Deficient 1·0 per cent. solids-not-fat ; freezing point indicated 4·1 per cent. extraneous water	Same vendor. Section 32 (3) Food and Drugs Act, 1955. Fined £12.10.0. and £10.10.0 costs.
N.6167	Deficient 6·6 per cent. fat ; freezing point indicated 2·3 per cent. extraneous water.	
N.6168	Deficient 16·6 per cent. fat and 3·5 per cent. solids-not-fat ; freezing point indicated 5·7 per cent. extraneous water.	
N.6169	Deficient 13·3 per cent. fat ; freezing point indicated 2·5 per cent. extraneous water.	
N.6170	Deficient 3·5 per cent. solids-not-fat ; freezing point indicated 4·3 per cent. extraneous water.	
C.9628	Deficient 2·9 per cent. solids-not-fat ; freezing point indicated 6·1 per cent. extraneous water.	Section 2 Food and Drugs Act, 1955. Fined £25 and £9.9.0 costs.

Adulteration of Milk : the County compared with other Areas

In the following table the percentage of milk adulteration for the year 1962 is given for a number of districts in England whose figures were available at the time of writing. The corresponding figure for the County of Lancaster was 2·9 per cent. as against 3·5 per cent. in the years 1960 and 1961. The percentage of milk adulteration in the County for the year under review is slightly lower than the average (3·3 per cent.) for the areas included in the table. The rate of adulteration in these districts varied from 7·4 to 0·3 per cent.

Table 13
Milk Adulteration, 1962. Various Areas

Area	Number of Samples	Per cent. of Adult.	Area	Number of Samples	Per cent. of Adult.
Durham, County ...	1,212	4·7	Bristol	451	6·9
Kent, County ...	1,205	3·1	Leeds... ..	2,407	0·3
Somersetshire, County ...	1,437	3·1	Leicester	1,235	0·8
Staffordshire, County ...	3,530	1·0	Liverpool	2,642	4·1
Surrey, County ...	396	1·3	Manchester	1,280	4·6
Worcestershire, County ...	4,660	7·4	Portsmouth	621	0·5
Birmingham ...	2,855	0·9	Salford	671	4·6
			Southampton ...	152	5·9

The Standards of Quality for Milk

In some countries there is a definite standard of quality required for liquid milk sold to the public ; it is then illegal to sell milk which is below that standard. In this country the law is less stringent. The present Food and Drugs Act contains no standards for milk. The position remains very much as it was before this Act came into operation, in that the one requirement laid down by law is that milk must be sold to each purchaser in the condition in which it came from the cow. If it attains a certain limit or exceeds it, it may be regarded as above suspicion, and if it is below that limit it only becomes suspect, and it falls to the lot of the person who sold it to establish, if he can, before the Court that nothing has been added to it, or no ingredient abstracted from it.

In furtherance of the principle outlined in the preceding paragraph, presumptive limits for the composition of milk were established after exhaustive enquiries by a Government Committee appointed by the Board of Agriculture in 1900. The deliberations of this Committee resulted in the making of the Sale of Milk Regulations, 1901, which were modified as regards skimmed milk in 1912. These Regulations were reproduced, in effect unaltered, in October, 1939, in the Sale of Milk Regulations, 1939, and they have been continued in force by the Food and Drugs Act, 1955. The presumptive standards are as follows:—

(1) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 3 per cent. of milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1955, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-fat, or the addition thereto of water.

(2) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 8·5 per cent. of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1955, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

(3) Where a sample of separated milk (not being condensed milk) contains less than 8·7 per cent. of milk-solids, other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1955, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

The above presumptive standards with regard to the composition of milk have, therefore, been operative for some 60 years. Within recent years, however, they have been under a considerable amount of criticism, implying that they do not accord with present day conditions. Another Government Committee was, therefore, appointed during the year 1958 to consider the composition of milk from the standpoint of human nutrition and animal husbandry and to recommend any changes in legislation considered desirable. This Committee under the Chairmanship of Dr. J. W. Cook published its report in September 1960. It recommended as far as standards of composition are concerned, that milk should still be sold as it comes from the cow but that within ten years a fixed minimum standard of 8·5 per cent. solids-not-fat should apply to milk sold by retail. Similarly, for milk on sale to the consumer the presumptive standard of 3 per cent. for milk-fat should, within five years, be made an absolute minimum standard and the abstraction of fat from milk intended for sale as whole milk should be a specific legal offence. Another recommendation was that the Hortvet Freezing Point Test should be accepted in legal proceedings as proof (subject to certain provisos) of the presence or absence of extraneous water.

Channel Islands Milk and South Devon Milk

In addition to the presumptive standards of quality, which are applicable to all milk, a special standard for milk-fat of not less than four

per cent. was originally prescribed in the Milk (Control and Maximum Prices) (Great Britain) Order, 1947, for "Channel Islands Milk" and for "South Devon Milk". The enforcement of this standard was the responsibility of the Ministry of Agriculture, Fisheries and Food, but during the year 1956, the Milk and Dairies (Channel Islands and South Devon Milk) Regulations came into operation and made food and drugs authorities responsible for enforcing the standard. "Channel Islands Milk" and "South Devon Milk" are defined by the Milk (Great Britain) Order, 1962, as being milk (a) which is produced from cows of the Channel Islands or South Devon Breeds and (b) which is labelled "Channel Islands Milk," "Jersey Milk," "Guernsey Milk" or "South Devon Milk" when sold in a container. This last Order also prescribes maximum prices for Channel Islands and South Devon Milk. The enforcement of the maximum price is still the responsibility of the Ministry of Agriculture, Fisheries and Food, and Food and Drugs authorities are, therefore, requested to report to the Ministry details of any samples of Channel Islands and South Devon Milk sold at the higher price prescribed which are found to contain less than four per cent. of fat. This is, of course, in addition to any enforcement action in regard to fat deficiency which the Food and Drugs authority may, itself, decide to take. During the year 1962, 416 samples of Channel Islands Milk were examined (361 were submitted by County Sampling Officers, and 55 by Autonomous Authorities). They were found upon analysis to have an average milk-fat content of 4.79 per cent. and an average solids-not-fat content of 9.02 per cent.

Of the 416 samples examined 408 were found to be satisfactory. Of the eight unsatisfactory samples (six County) No's N.5961, N.7189, N.8058 and N.6126 were found to have milk-fat contents of only 3.95, 3.90, 3.95 and 3.85 per cent. respectively. Follow-up samples taken in respect of samples No's N. 5961, N.7189 and N.6126 were found to be genuine. The producer of sample No. N.8058 was cautioned. The two remaining County samples, No's N.6438 and C.8923 were reported upon adversely because they were both found to contain 0.5 I.U's penicillin per millilitre and the respective farmers were interviewed and the Milk Production Officer informed. Of the two unsatisfactory samples from separate Autonomous Food and Drugs Authorities, one had a milk-fat content of only 3.75 per cent. and the vendor was cautioned while the other contained 10.0 per cent. extraneous water. A follow-up formal sample to this last mentioned informal sample proved to be genuine.

The Average Composition of Milk during the Year

Genuine milk has not always the same composition. There are natural variations in the amounts of both fat and solids-not-fat in milk as drawn from the cow. It, therefore, becomes a matter not only of interest but also of importance and significance, to know the average values for these two constituents. This information is given for the year 1962 in table 14, where it will be seen that the average figure for fat is 3·70 per cent, for solids-not-fat 8·61 per cent. and for total solids 12·31 per cent.

It should be pointed out that the average compositions and frequencies included in this section of the Report are calculated from the results of all the samples of milk (other than Channel Islands milk) received ; that is to say, there are included all adulterated samples and further, all appeal-to-cow samples, whether they were above or below the limits for fat and solids-not-fat laid down by the Sale of Milk Regulations. The figures for average composition calculated on this basis will, therefore, tend to be somewhat lower than those for genuine milk sold in the County.

Table 14
Average Composition of Milk, 1962

Month	Number of Samples*	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
January ...	600	3·68	8·58	12·26
February ...	1,472 { 465	3·66 { 3·64	8·57 { 8·57	12·23 { 12·21
March ...	407	3·66	8·56	12·22
April ...	421	3·62	8·55	12·17
May ...	1,308 { 633	3·59 { 3·59	8·62 { 8·63	12·21 { 12·22
June ...	254	3·53	8·71	12·24
July ...	541	3·62	8·62	12·24
August ...	1,380 { 471	3·69 { 3·74	8·63 { 8·62	12·32 { 12·36
September ...	368	3·75	8·66	12·41
October ...	611	3·86	8·66	12·52
November ...	1,260 { 464	3·85 { 3·87	8·62 { 8·61	12·47 { 12·48
December ...	185	3·78	8·54	12·32
Whole year ...	5,420	3·70	8·61	12·31

* Includes Appeal-to-Cow samples but does not include Channel Islands milk and five samples of Milk examined for foreign matter only.

The Average Composition of Milk for each Month of the Year

Table 14 also includes the figures for the averages of fat and solids-not-fat for each month of the year. As regards fat it will be seen that June has the lowest figure, 3.53 per cent., and November the highest, 3.87 per cent. In respect of solids-not-fat, the lowest figure was obtained in December, 8.54 per cent., the highest in June, the figure then being 8.71 per cent. These variations, particularly in respect of fat content, have been the general experience for many years, the fat content usually being at its lowest in the spring and at its highest in the autumn. Solids-not-fat tend to be lower in the winter.

The Average Composition of Morning and Evening Milk during the Year

Usually, when samples are submitted, the information is given whether they are morning or evening milks. It has, therefore, been possible to classify them so as to show the average composition of morning and evening milks separately.

When cows are milked at the usual intervals the evening milk, due to the shorter interval, is richer in fat than the morning milk, while there is little if any difference as a rule in solids-not-fat. This is illustrated in table 15 below, where the average fat for morning milk is 3.58 per cent., and the evening fat 4.00 per cent.; the fat in the evening milk being greater by 0.42 per cent., while the averages for solids-not-fat are very similar for both morning and evening milk.

Table 15

*The Average Composition of Morning and Evening Milk
during the Year 1962*

	Number of Samples*	Fat per cent.	Solids-not-fat per cent.	Total solids per cent.
Morning Milk	907	3.58	8.60	12.18
Evening Milk	730	4.00	8.64	12.64
Mixed Milk ...	33	3.64	8.54	12.18
Unknown ...	3,750	3.67	8.61	12.28
Total ...	5,420	3.70	8.61	12.31

* Includes Appeal-to-Cow samples but does not include Channel Islands milk and five samples of Milk examined for foreign matter only.

The Average Composition of Milk : compared with past years

In table 16 the average composition of all the milks examined is set out for the period 1910–1962. And it will be seen that the average figure for fat does not vary greatly from year to year. In respect of solids-not-fat there is very little difference in the averages for the years 1910–1940. Since 1940, however, it will be noted there has been an appreciable decrease in solids-not-fat, the lowest figure of 8·55 per cent. being obtained in the year 1943. The average for solids-not-fat for the year under review was 8·61 per cent., while the average for the whole period for which records have been kept is 8·80 per cent. Since the year 1943 there has been, in general, a tendency for solids-not-fat to show an upward trend but they are still appreciably below the pre-war figures.

Table 16
Average Composition of Milk, 1910–1962

Year	Number of Samples	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
1910 to 1930 ...	56,028	3·67	8·90	12·57
1931	3,090	3·84	8·81	12·65
1932	3,205	3·77	8·85	12·62
1933	3,060	3·76	8·82	12·58
1934	3,310	3·74	8·81	12·55
1935	3,422	3·75	8·84	12·59
1936	3,098	3·73	8·88	12·61
1937	3,278	3·74	8·84	12·58
1938	3,398	3·70	8·78	12·48
1939	3,128	3·67	8·78	12·45
1940	2,144	3·70	8·79	12·49
1941	1,866	3·70	8·64	12·34
1942	1,516	3·75	8·66	12·41
1943	1,489	3·70	8·55	12·25
1944	1,197	3·69	8·57	12·26
1945	1,096	3·72	8·57	12·29
1946	2,776	3·75	8·58	12·33
1947	4,625	3·75	8·63	12·38
1948	4,523	3·67	8·64	12·31
1949	5,210	3·66	8·65	12·31
1950	5,362	3·68	8·67	12·35
1951	5,839	3·67	8·65	12·32
1952	5,844	3·67	8·68	12·35
1953	5,922	3·68	8·68	12·36

Table 16—continued.

Year	Number of Samples	Fat per cent.	Solid-non-fat per cent.	Total Solids per cent.
1954	5,182	3·71	8·65	12·36
1955	5,686	3·68	8·66	12·34
1956	5,524	3·71	8·59	12·30
1957	5,485	3·68	8·63	12·31
1958	5,439	3·68	8·63	12·31
1959	5,304	3·62	8·62	12·24
1960	5,062	3·64	8·66	12·30
1961	5,216	3·66	8·66	12·32
1962	5,420	3·70	8·61	12·31
1910 to 1962 ...	182,744*	3·71	8·80	12·51

* Does not include Channel Islands milk and 24 samples of Milk examined for foreign matter only.

Composition of Milk : the County compared with Other Areas

In table 17 below, figures are given for the composition of milk during the year 1962 in the areas of 15 other Food and Drugs Authorities. The corresponding figures for the County of Lancaster, based upon 5,420 samples of milk are fat 3·70 per cent., solids-not-fat 8·61 per cent. and total solids 12·31 per cent. It will be noted that the Lancashire figure for fat is almost identical with the average for the other areas but the figure for solids-not-fat is lower by 0·10 per cent. The average figures for the areas listed are fat 3·68 per cent., and solids-not-fat 8·71 per cent.

Table 17
Composition of Milk, 1962. Various Areas.

Area	Number of Samples	Fat per cent.	Solids- not-fat per cent.	Total Solids per cent.
Durham, County ...	1,269	3·69	8·65	12·34
Kent, County ...	1,239	3·64	8·67	12·31
Somersetshire, County ...	1,460	3·81	8·63	12·44
Staffordshire, County	3,589	3·69	8·72	12·41
Surrey, County ...	396	3·64	8·76	12·40
Worcestershire, County	4,672	3·69	8·73	12·42
Birmingham ...	2,859	3·71	8·67	12·38
Bristol ...	451	3·63	8·76	12·39
Leeds ...	2,407	3·74	8·74	12·48
Leicester ...	1,235	3·70	8·75	12·45
Liverpool ...	2,642	3·70	8·73	12·43
Manchester ...	1,280	3·63	8·78	12·41
Portsmouth ...	621	3·74	8·70	12·44
Salford ...	671	3·57	8·68	12·25
Southampton ...	152	3·70	8·68	12·38

The Composition of Milk : Frequencies

The 5,420 samples of milk examined for chemical composition during the year have been arranged in table 18 to show the number of samples having the same percentage of fat, or, in other words, the frequency with which each percentage of fat, differing by 0·1 per cent., occurred. The table has been shortened by placing in separate groups all samples containing less than 2·5 per cent. and above 3·9 per cent. This information is given for the whole year and for each month of the year.

This table gives different information than do figures for averages. It shows that, as in previous years, there are comparatively few samples below 3·0 per cent. It also shows how the figures from which the averages are calculated are distributed, information which is not obtainable from the figures for averages alone.

In this table, and the following one, table 19, all samples of milk are included whether adulterated or not, and also all appeal-to-cow samples.

Table 18

*Composition of Milk : Frequencies.**Fat*

	Number of Samples												
Per cent.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 2·5	0	3	2	1	2	2	0	1	0	0	0	0	11
2·5	1	0	0	0	1	2	0	1	0	0	0	0	5
2·6	0	1	0	0	1	1	0	1	1	1	1	0	7
2·7	0	0	0	1	8	1	1	1	0	2	1	0	15
2·8	0	3	1	1	3	5	3	2	1	2	1	0	22
2·9	2	4	2	1	4	3	1	1	4	0	0	2	24
3·0	12	9	9	9	18	12	8	6	3	6	4	1	97
3·1	9	17	9	9	24	8	14	10	9	5	5	0	119
3·2	9	12	10	14	15	9	11	10	12	10	3	5	120
3·3	19	15	24	20	38	28	29	15	15	11	9	3	226
3·4	32	37	25	44	88	34	62	22	9	13	8	8	382
3·5	81	81	75	101	128	52	136	52	30	22	13	4	775
3·6	169	128	101	108	118	36	123	110	72	49	41	20	1,075
3·7	125	54	58	35	62	14	58	103	94	129	78	52	862
3·8	50	21	22	19	29	12	24	34	44	167	124	33	579
3·9	22	19	15	12	20	5	18	17	11	55	72	31	297
4·0 and Over	69	61	54	46	74	30	53	85	63	139	104	26	804
Totals	600	465	407	421	633	254	541	471	368	611	464	185	5,420

Table 19 gives the frequencies for solids-not-fat. It has already been stated that the average figure for solids-not-fat for the year was 8·61 per cent., and the bulk of the individual figures for solids-not-fat are arranged closely around the average. Tables 18 and 19 bring out the further point that a much higher proportion of milks fall below the presumptive limit of 8·5 per cent. for solids-not-fat than fall below the presumptive limit of 3·0 per cent. for milk-fat.

Table 19
Composition of Milk : Frequencies.
Solids-not-fat

Per cent.	Number of Samples												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 7·8	0	5	0	3	2	1	1	1	1	0	0	0	14
7·8	0	1	0	0	1	0	0	0	0	0	0	0	2
7·9	0	1	0	2	0	0	0	0	0	1	0	0	4
8·0	2	3	0	1	1	0	0	0	0	3	0	0	10
8·1	1	2	2	3	1	0	2	1	2	1	1	2	18
8·2	5	5	8	3	6	4	3	5	2	9	7	6	63
8·3	21	20	17	14	11	3	9	7	5	12	21	11	151
8·4	53	41	69	58	44	8	35	39	8	25	35	40	455
8·5	208	173	140	192	139	27	142	146	59	103	111	57	1,497
8·6	192	120	101	86	215	65	189	131	130	182	145	40	1,596
8·7	83	52	46	33	128	75	102	81	97	175	96	20	988
8·8	20	27	14	14	50	36	37	37	34	56	28	6	359
8·9	11	6	3	5	21	20	17	18	16	33	13	2	165
9·0 and Over	4	9	7	7	14	15	4	5	14	11	7	1	98
Totals	600	465	407	421	633	254	541	471	368	611	464	185	5,420

Samples of Milk taken for Comparison

Part II of the Seventh Schedule of the Food and Drugs Act, 1955, contains certain provisions relating to the procuring of comparison samples of milk. Briefly, when a sample of milk is obtained from a vendor he must, if so requested, give to the Sampling Officer the name and address of the person from whom he, in turn, received the milk.

The vendor may also within 60 hours of the sample being taken, serve on the Food and Drugs Authority a notice stating the name and address of the person from whom he received the milk and the time and place of delivery to himself of milk from a corresponding milking, and requesting the Authority to procure, as soon as practicable, a sample of milk from a corresponding milking in course of transit or delivery to himself. The vendor shall have no right to request such a sample if the original sample procured from him was a mixture of milk produced on

more than one dairy farm. In turn, the dairyman from whom such a sample of milk is procured in course of transit or delivery, may, within 60 hours after the sample was procured, serve on the Authority concerned a notice requesting that immediate steps be taken to procure a sample of milk from a corresponding milking of the cows. The person procuring this last sample shall be empowered to take such steps at the dairy as may be necessary to satisfy himself that the sample is a fair sample of the milk of the cows when properly and fully milked. It is the practice in the County for the Sampling Officers to take, in appropriate cases, follow-up and appeal-to-cow samples without a formal request being made by the vendor.

Appeal-to-Cow Samples

Appeal-to-cow samples, or, as they are sometimes called, “byre” samples, if the method of taking them is properly carried out in every detail, may be regarded in the light of a final appeal. The milking must be carefully supervised, it must be established that the same cows are milked, that it is the corresponding milking and the dairy equipment must be inspected to see that it is clean and dry. The results of analyses of samples procured in this way must be accepted as those pertaining to genuine milk. Appeal-to-cow samples serve at least two purposes. In the first place, they show, in cases where an unsatisfactory sample has been sold, the quality of the unadulterated milk given by the cows, and, secondly, extend our knowledge of the quality of the milk of different herds and of the natural variations which may occur in the composition of genuine milk.

It was with the former object in view that the practice of taking appeal-to-cow samples was instituted, *viz.*, to ascertain the composition of the milk given by the cows. It is now generally admitted that the composition of the milk from a herd of cows may occasionally fall below the limits laid down in the Sale of Milk Regulations, particularly at the morning milking. When such a milk is examined the question arises whether it is an unadulterated milk of poor quality, or a milk of normal composition which has been tampered with; the appeal-to-cow sample is intended to help to solve this problem.

In table 20 there is given a list of appeal-to-cow samples, submitted by County Sampling Officers during the year 1962, and also the results of analysis. Twenty-two such samples are included, representing nine herds, the number of cows in the herds varying from four to 28.

In addition two appeal-to-cow samples were examined for autonomous authorities.

*Analysis Of Appeal-to-Cow Samples of Milk**Table 20*

Number	Number of cows milked	Approx. yield gallons	Morning or Evening	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C	Taken for comparison with numbers	Observations
956	4	5	M	2.87	8.55	—0.542	E.9194	Poor in fat.
957	5	6½	M	2.92	8.81	—0.543		Poor in fat.
958	1	½	M	2.02	9.31	—0.542		Poor in fat.
1105	22	9	M	3.55	8.31	—0.533	C.7866, C.7867, C.7868 and C.7869	Low in solids-not-fat.
1106		8	M	3.30	8.04	—0.535		Low in solids-not fat.
1107		9	M	3.05	8.39	—0.537		Low in solids-not-fat.
1108		5½	M	3.12	8.02	—0.537		Low in solids-not-fat.
959	6	8	M	2.45	8.27	—0.534	E.9462	Poor in fat and low in solids-not-fat.
960	7	10	M	3.00	8.32	—0.534		Low in solids-not-fat.
1109	12	9½	M	3.32	8.68	—0.545	C.8087 and C.8088	Low in solids-not-fat.
1110		6	M	3.35	8.37	—0.542		
1111	4	5½	M	2.47	8.33	—0.534	C.8142	Poor in fat and low in solids-not-fat.
1112	12	10½	E	3.50	8.50	—0.545	C.8240	
1079	3½		M	2.25	8.79	—0.542	N.6166, N.6167, N.6168, N.6169 and N.6170.	Poor in fat.
1080	2½	25	M	3.10	8.76	—0.536		
1081	5		M	3.35	8.55	—0.539		
1114	12	10	E	4.35	8.92	—0.534	C.8474.	Low in solids-not-fat.
1115	13	11	E	4.05	8.69	—0.534		
1116	1	1	E	3.55	8.26	—0.533		
1117	9	10	M	3.30	8.36	—0.537	C.9628	Low in solids-not-fat.
1118	11	10	M	3.65	8.75	—0.540		
1119	8	10	M	3.85	8.93	—0.543		

An inspection of table 20 shows that the freezing point depression of the appeal-to-cow samples was determined in every case, and this gave valuable evidence of the authenticity of the samples. Although ten of the appeal-to-cow samples were found to be naturally poor in solids-not-fat, in no such instance was the freezing point of the sample above -0.530°C. (Hortvet), the figure which is usually accepted as the highest freezing point normally given by milk free from extraneous water. The freezing point of the 22 appeal-to-cow samples varied between -0.533°C. (Hortvet) to -0.545°C. (Hortvet); the average figure being -0.538°C. (Hortvet). The average freezing points of appeal-to-cow samples examined during the five years, 1957 to 1961 inclusive, were -0.546°C. , -0.540°C. , -0.540°C. , -0.542°C. and -0.539°C.

Milk Supplied to Schools, Day Nurseries, Children's Homes and Homes for the Aged

The 278 samples of milk marked "Private" in table 3 were taken from consignments delivered to Schools, Day Nurseries, Children's Homes and Homes for the Aged in the County. Nine of these were adulterated, corresponding to an adulteration rate of 3.2 per cent. This figure is very slightly higher than the total milk adulteration rate for the County which was 2.9 per cent.

Of the 278 samples, 243 were taken at Schools. Nine of these were found to be adulterated or otherwise unsatisfactory. Three samples from the same supply were found to contain traces of mineral oil which was probably derived from the bottle capping machine and the dairy was cautioned. Three other samples were found to have small fat deficiencies and the producers were notified in each case. Two informal samples were found to contain extraneous water but further formal samples proved to be genuine. The remaining sample contained a tightly rolled up used drinking straw and the dairy was notified.

It should be mentioned that the somewhat higher adulteration rate in respect of school milks is associated with the fact that staff and children at county schools have been asked by the Chief Education Officer to report all instances where it is suspected that foreign matter is present in bottles of milk delivered to schools. These instances are then brought to the notice of the County Medical Officer of Health and the suspect bottles of milk are submitted for analysis. It follows, therefore, that there is a considerable degree of selective sampling of school milks containing foreign matter and this results in a higher proportion of adulterated samples.

Fifteen samples were taken at Day Nurseries, fifteen at Homes for the Aged and five from Children's Homes. All these samples were found to be satisfactory.

Samples of Milk deficient in solids-not-fat but genuine

Attention has already been drawn in the sections of this Report dealing with the "Standards of quality for milk," "Composition of Milk : Frequencies" and "appeal-to-cow" samples, to the fact that milk as it comes from the cow is not always of such quality as to comply with the minimum presumptive limits of 3·0 per cent. for milk-fat and 8·5 per cent. for solids-not-fat, of the Sale of Milk Regulations, 1939. In order to decide whether such samples submitted under the Food and Drugs Act were in fact as given by the cow, and therefore genuine, it is still necessary in the case of presumed fat deficiencies to make an actual comparison with an "appeal-to-cow" sample from a corresponding milking. Formerly, this was also the only means by which it could be decided whether a sample low in solids-not-fat was of naturally poor quality or whether it had been adulterated by the addition of water. For the past 30 years or so, however, it has been possible by submitting the sample to the Hortvet freezing point test for the Analyst to obtain additional evidence that a deficiency in solids-not-fat was due to the presence of extraneous water or, alternatively, that it was due to natural causes.

In the section of the revised Ministry of Health memorandum 36/Foods (1939), dealing with Public Analysts' quarterly reports, it is laid down that in the case of samples below the presumptive limits of the Sale of Milk Regulations, the report should show whether they were adjudged genuine by the Analyst on other grounds. It is now the normal procedure to submit all samples low in solids-not-fat to the Hortvet freezing point test and to include in the quarterly reports a table giving details of such samples which satisfactorily pass the test.

During the year under review, 647 County samples of milk were found to be poor in solids-not-fat, but were adjudged genuine by the Hortvet freezing point test. This figure corresponds to 11·9 per cent. of the total milk samples (including "appeal-to-cow") submitted by County Sampling Officers. These poor quality milks were distributed over the year as follows :—224 in the March quarter, 143 in the June quarter, 115 in the September quarter and 165 in the December quarter. The samples were not, therefore, confined to any particular season of the year, although the greatest number was obtained towards the end of the winter and the lowest at the end of the summer. The lowest

figure for solids-not-fat shown by any of these samples was 7·80 per cent., the next lowest being 7·90 per cent.

Each year it is usual to find an appreciable number of milk samples which are poor in solids-not-fat but are nevertheless adjudged genuine as the result of applying the Hortvet freezing point test. The number of such samples, *viz.*, 11·9 per cent., submitted during the year under review is higher by 5·2 per cent. than for the year 1961, when the figure was 6·7 per cent. In the five years preceding the year 1961 the percentage of milk samples coming under this heading varied from 6·8 to 12·8 per cent.

It will be noted that the percentage of milk samples poor in solids-not-fat but genuine by the freezing point test for the year 1962, *viz.*, 11·9 per cent., is very high when compared with the percentage of adulterated milk samples for the same year, *viz.*, 2·9 per cent. The difference is even more striking when it is considered that the last mentioned figure includes all samples containing extraneous water and all samples containing less than 3·0 per cent. milk-fat whether or not, in the latter instance, the corresponding appeal-to-cow samples indicated that the fat deficiencies were actually due to abstraction or merely to natural causes.

The relatively high proportion of milks found to be naturally deficient in solids-not-fat, which is by no means confined to Lancashire, is undoubtedly one of the factors which influenced the Government to appoint a Committee in the year 1958 to consider the Composition of Milk. (The findings of this Committee are referred to in the section of this report dealing with "The Standards of Quality for Milk.")

Adulteration of Articles other than Milk

During the year under review there were examined for the County 3,381 samples other than milk; of these 178 were reported against, this corresponds to an adulteration rate of 5·3 per cent., which is lower than the figure obtained in the year 1961, when it was 7·4 per cent. The percentage of adulteration in articles other than milk for the year under review, was much higher than that for milk, *viz.*, 2·9 per cent. An examination of tables 3 and 21 shows that sausages, samples containing extraneous matter or insects and samples whose labels did not conform to the requirements of the Labelling of Food Order contributed especially to the overall adulteration rate. Of the 178 unsatisfactory samples, 34 consisted of sausage, 42 were incorrectly labelled and 42 contained extraneous matter or insects.

Table 21 gives a list of the articles other than milk submitted by County Sampling Officers which were found to be unsatisfactory with particulars of the type of adulteration and the action taken.

Samples, other than Milk, adulterated or otherwise giving rise to irregularity.

Table 21

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.7544	Boric Lint, B.P.C.	Informal	Contained only 1.3 per cent. of Boric Acid. B.P.C. limits 3.0 to 7.0 per cent. Boric Acid.	Packers communicated with and stock withdrawn from sale.
E.5608	Part of a Mince Tart.	Informal	Contained a partially smoked tobacco cigarette.	Prosecution under Section 2 Food and Drugs Act. Unconditional discharge on payment of £7.7.0 costs.
E.8973	Pork Sausages.	Informal	Contained 170 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
E.9004	Seidlitz Powders (Double Strength)	Informal	Should be labelled Double Strength Seidlitz Powders B.P.C. and the words "prepared according to the B.P." deleted.	Packers communicated with.
E.9005	Seidlitz Powders.	Informal	Sample consisted of three powders. Contents of two white packets weighed 3.03 and 2.83 grammes respectively. B.P.C. limits for white packets 2.25 to 2.75 grammes.	Packers communicated with.
E.9036	Beef Sausages.	Informal	Contained 230 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
E.9037	Pork Sausages.	Informal	Meat content 54.0 per cent. Contained 150 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Poor in meat content. Vendor interviewed re preservative.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.9038	Pork Sausages.	Informal	Meat content 51·0 per cent.	Poor in meat content.
E.9097	Glycerin, B.P.	Informal	Contained 0·4 per cent. excess water.	No action advised.
N.5845	Fruit Salad, Bottled.	Informal	Apple present in greater quantity than apricot which was listed first in statement of ingredients.	No action advised.
E.9106	Soup (reconstituted from soup powder).	Informal	Contained 32 beetles (<i>Ptinus Tectus</i>) as larvae, pupae and adults. Five other packets from same stock satisfactory.	Vendor communicated with.
E.9121	Scidlitz Powders, B.P.C.	Informal	Sample consisted of three powders. Contents of one blue packet weighed 10·94 grammes. B.P.C. limits for blue packets 9·5 to 10·5 grammes.	Vendor communicated with
E.9208	Portion of Meat Pie.	Informal	Sample contained 15 milligrams of sand.	Manufacturer cautioned.
C.7697	Boracic Lint, B.P.C.	Informal	Contained only 1·6 per cent. Boric Acid. B.P.C. limits 3·0 to 7·0 per cent. Boric Acid.	Manufacturers communicated with.
N.5933	Portion of Cake.	Informal	A splint of soft wood, charred at one end, of the nature of a spent match.	Prosecution under Sections 2 and 113 (3) Food and Drugs Act. Fined £10 and £7.7.0 costs.
N.5961	Channel Islands Milk.	Informal	Fat content 3·95 per cent. Deficient 1·2 per cent. fat.	Processor cautioned and Ministry of Agriculture, Fisheries and Food informed.
9964.S	Pork Sausages.	Private	Total meat content 72·0 cent. including 34·0 per cent. fat. Fat should not exceed 29·0 per cent. The fat present was predominantly beef or mutton fat and not pork fat.	Purchasing department informed.
E.9284	Sweets (Treacle Toffee)	Informal	Contained 27 parts per million of Copper. Recommended limit 20 parts per million.	Vendor and manufacturer communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.7780	Boracic Lint, B.P.C.	Informal	Contained only 2.1 per cent. Boric Acid. B.P.C. limits 3.0 to 7.0 per cent. Boric Acid.	Manufacturers taking steps to prevent a recurrence.
C.7795	Boracic Lint, B.P.C.	Informal	Contents of packet weighed only five sixths of an ounce compared with one ounce declared.	Weights and Measures Inspector informed. Vendor, wholesaler and manufacturer communicated with.
S.45	Gravy Browning.	Informal	Contained 1.0 per cent. salt without declaration in list of ingredients.	Manufacturers communicated with.
E.9158	Pork Sausages.	Informal	Meat content 61.5 per cent.	Poor in meat content.
E.9190	Soft Cheese with Shrimps.	Informal	Sample contained prawns and not shrimps as stated on label.	Packers communicated with.
E.9304	Penicillin V Tablets.	Informal	Sample consisted of Penicillin V 250 milligram tablets and were not 125 milligram tablets as prescribed.	Pharmacist communicated with.
S.98	Flour.	Informal	Creta praeparata only 210 milligrams per 100 grammes (limits 235–390 milligrams per 100 grammes).	Millers communicated with.
N.7093	Beef Sausages.	Informal	Contained 190 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
E.9361	Bread.	Informal	The outer surface of the bottom crust bore particles of dough discoloured with burnt flour, weighing in all 20 milligrams.	Complainant informed.
E.9380	Camphorated Oil.	Informal	Contained 21.6 per cent. Camphor. B.P. limits 19 to 21 per cent.	Vendor communicated with.
S.202	Pork Sausages.	Informal	Contained 260 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.

Table 21—continued.

No. of Sample	Description	Formal. Informal or Private	Nature of Adulteration or Irregularity	Observations
S.203	Pork Sausages.	Informal	Contained 170 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
S.204	Beef Sausages.	Informal	Contained 615 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration. Maximum permitted limit for sulphite preservative when declared in sausages 450 parts per million.	Formal sample advised.
E.5609	Part tin of Meat	Informal	Contained a triangular piece of steel plate $3\frac{1}{4}$ inches long and weighing 2 ounces which had been soldered on one side.	Manufacturers communicated with and interviewed.
C.7965	Seidlitz Powders.	Informal	Should be labelled Seidlitz Powder, B.P.C.	Packers notified.
C.7967	Pork Sausages.	Informal	Contained 120 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
N.7147	Gravy Browning.	Informal	Contained 1.0 per cent. salt without declaration.	Same manufacturer as sample No. S.45.
N.7165	Pork Sausages.	Informal	Contained 60 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
E.5611	Cube of Sugar.	Informal	Contained a flake of magnetic oxide of iron weighing nine milligrams.	Complainant informed and packers communicated with.
E.9429	Beef Sausages.	Private	Contained 260 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
C.8000	Potato Cakes.	Informal	Contained 0.21 gramme of charred starch.	Complainant informed and packers communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.8006	Glycerin, B.P.	Informal	Contained 0·4 per cent. excess water.	No action advised.
N.7189	Channel Islands Milk.	Formal	Fat content only 3·90 per cent. and slightly low in solids-not-fat.	Vendor cautioned.
E.9459	Chocolate	Informal	Contained a dead pupa and a dead larva of the Cocoa Moth, together with web- bing and excreta.	Stock withdrawn from sale.
N.7202	Pork Sausages.	Informal	Meat content 60·5 per cent. Contained 335 parts per million of sulphite preserva- tive (expressed as sulphur dioxide) without declara- tion.	Poor in meat content. Vendor interviewed re preservative.
E.9455	Chocolate.	Informal	Contained some insect excreta and webbing.	See sample No. E.9459.
S.336	Seidlitz Powders, B.P.C.	Informal	Consisted of three powders. Contents of one blue packet weighed 10·7 grammes. B.P.C. limits for blue packets 9·5 to 10·5 grammes.	Packers communicated with and gave assurance to prevent recurrence.
S.340	Fish Paste.	Informal	Contained 4·8 per cent. starch. Starch omitted from voluntary list of ingredients.	Manufacturers communicated with.
E.9627	Beef Sausages.	Informal	Contained 105 parts per million of sulphite preserva- tive (expressed as sulphur dioxide) without declara- tion.	Vendor cautioned.
E.9628	Pork Sausages.	Informal	Contained 70 parts per million of sulphite preserva- tive (expressed as sulphur dioxide) without declara- tion.	Vendor cautioned.
C.8129	Mixed Pickles.	Informal	Cauliflower present exceeded gherkin. Gherkin listed first in statement of ingredients.	Packers notified.
N.7275	Semolina.	Informal	Contained one live book- louse.	No action advised.
S.376	Flour.	Informal	Contained 0·20 only milli- gram Vitamin B ₁ per 100 grammes. (Limit not less than 0·24 milligram per 100 grammes).	Millers communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.9633	Flour.	Informal	Contained only 199 milligrams Creta Praeparata and 0.16 milligram Vitamin B ₁ , per 100 grammes. (Limits 235–390 milligrams Creta Praeparata and not less than 0.24 milligram Vitamin B ₁).	Millers communicated with.
N.8021	Fish, Canned.	Informal	Contained 27 parts per million Copper. Maximum recommended limit 20 parts.	Packers notified.
N.8050	Sliced Brown Bread.	Informal	Contained 0.074 gramme of cotton and rayon cloth	Bakery cautioned.
S.484	Fruit Salad, Canned.	Informal	Pineapple present in greater quantity than apricots and were, therefore, in wrong order in list of ingredients.	Packers communicated with.
E.9659	Portion of small white loaf and separately several crumbs of bread	Informal	Breadcrumbs submitted separately contained 16 milligrams of dough discoloured brown with 2.7 milligrams of used mineral oil containing 0.02 milligrams Iron. The part loaf submitted had no further contamination.	Bakery and complainant notified.
E.9667	Pork Sausages.	Informal	Meat content 62.0 per cent. Poor in meat content. Contained 230 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned re preservative.
E.9668	Pork Sausages.	Informal	Contained 100 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
E.9680	Pork Sausages.	Private	Contained 275 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
C.8214	Part Jar of Jam.	Informal	Sample contained a blow fly weighing 40 milligrams and a very small unidentified fly weighing 2 milligrams. The former had been heated in the jam but the latter gave a strong phosphatase reaction.	Manufacturers communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.8058	Channel Islands Milk	Formal	Fat content only 3·95 per cent.	Produeer cautioned.
N.8088	Blancmange Powder.	Informal	“Salt” declared on inner packets but omitted from overall list of ingredients on outer carton.	Manufacturers notified.
E.9729	Sweets (Butter Drops)	Informal	Butterfat content only 1·14 per cent. and coloured with the prohibited dye Rhodamine B.	Formal sample advised. See sample No. E.9772.
E.9758	Pork Sausages.	Informal	Meat content only 54·5 per eent. Poor in meat content. Contained 280 parts per million of sulphite preservative (expressed as sulphur dioxide) without deelara-tion.	Vendor eautioned re preservative.
E.9760	Piekled Red Cabbage.	Informal	Contained 1·5 per cent. salt without declaration in list of ingredients.	Paekers eommunieated with.
C.8256	Vegetables, dried (Peas)	Private	Approximately 5·0 per eent. of the peas were marked by insect damage—two peas contained insect exereta and webbing.	Stoek and premises examined.
E.9772	Butter Drops	Formal	Sample was defieient of 65·0 per cent of the minimum percentage of butterfat. Also contained Rhodamine B which is not a permitted coal tar colour.	Seetion 2, Food and Drugs Aet, 1955, and Regulation 5 of Colouring Matter in Food Regulations, 1957. Fined £10.10.0 and £10.10.0 costs.
C.8346	Vegetables, dried (Peas)	Informal	Contained 2·8 per eent. of discoloured or damaged peas.	No aetion advised.
S.682	Potted Shrimps.	Informal	Sample eonsisted of two cartons of potted shrimps, one of which was sealed with a mixture of butter and fat of the nature of margarine. No statement of presence of added fats in list of ingredients on earton.	Paekers eommunieated with.
N.6080	Ice-Cream	Informal	Milk solids-not-fat content 6·8 per eent. (should be not less than 7·5 per eent.).	Vendor interviewed and eautioned.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.6126	Channel Islands Milk	Formal	Fat content only 3.85 per cent.	Processor cautioned and Ministry of Agriculture, Fisheries and Food informed. Further sample genuine.
N.6113	Fruit Curd (Lemon)	Informal	Label bore no name of the food.	Manufacturers taking steps to label product in future.
N.6114	Marmalade	Informal	Soluble solids only 67.0 per cent and in a container which was not hermetically sealed. Should be 68.5 per cent. No declaration of net weight.	Manufacturer communicated with and Weights and Measures Inspector informed.
E.61	Bubble Gum	Informal	"Sugar" present in greater proportion than "Gum base" and should therefore precede it in the declared list of ingredients.	Manufacturers communicated with.
N.6112	Pickles	Informal	Contained 1.1 per cent. salt without declaration in list of ingredients.	Packers taking steps to amend labels.
E.129	Beef Sausages	Informal	Contained 295 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
N.6160	Barley Kernels	Informal	Contained a small amount of webbing from flour moth.	Advised stock be examined.
N.6165	Chicken Fillets, Bottled	Informal	Chicken content only 83.0 per cent. Should be labelled "Chicken Fillets in Jelly."	Importers communicated with.
E.105	Portion of Bread.	Informal	Contained one dead beetle measuring $\frac{2}{5}$ inch long and weighing 14 milligrams.	Bakery cautioned.
E.110	Bubble Gum	Informal	"Sugar" present in greater proportion than "Gum base" and should, therefore precede it in the declared list of ingredients.	Same manufacturer as No. E.61.
E.5614	Orange Drink	Informal	A film of fungus, which also contained atmospheric dust, a very small fly and algae, adhered to and covered most of the inside base of the bottle.	Dairy cautioned.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.8547	Boric Acid Ointment, B.P.	Informal	Labelled “Boric Acid Ointment, B.P.” Should be labelled “Boric Acid Ointment B.P.C.”	Packers notified.
C.8540	Corned Beef Hash, Canned.	Informal	Contained only 41.0 per cent. meat.	Poor in meat content.
C.8560	Part loaf of bread.	Informal	Contained a hexagonal galvanised steel nut measuring approximately 0.44 inch by 0.22 inch and weighing 3.13 grammes.	Section 2, Food and Drugs Act, 1955. Fined £5 and £6.6.0 costs.
S.942	Cream Crackers	Informal	One biscuit and 2 part biscuits contained embedded in the top surface 49 specks of aluminium metal weighing in all 0.4 milligram.	Bakery cautioned and complainant informed.
S.943	Fragments of Fish Cakes	Informal	Contained part of the body of a blow-fly which weighed 31 milligrams.	Section 2, Food and Drugs Act, 1955. Fined £5 and £13.2.0 costs.
E.175	Orange Drink	Informal	Incomplete name and address of packers.	Packers communicated with.
C.8612	Ice-Cream	Informal	Contained only 3.3 per cent. fat. Should be not less than 5.0 per cent.	Formal sample genuine.
E.5615	Parts of two Fish Cakes.	Informal	Contained 0.9 gramme of overcooked or burnt potato and potato skin, otherwise genuine.	Complainant informed.
N.6245	Parrish's Chemical Food B.P.C.	Informal	Contained 0.5 per cent. w/v Iron. B.P.C. limits 0.40–0.45 per cent. w/v Iron.	Manufacturers communicated with.
N.6322	Fruit Salad, Canned	Informal	Pears listed first in statement of ingredients although peaches were found to be present in greatest quantity.	Packers communicated with.
S1045	Fragments of Fish Finger.	Informal	Contained a piece of fibro-cartilage weighing 1.2 grammes.	Manufacturers and complainant informed.
E.379	Beef Sausages	Informal	Contained 345 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.388	Corned Beef, Canned	Informal	Contained an unidentified beetle which weighed 77 milligrams.	Prosecution under Section 2 Food and Drugs Act. Absolute discharge on payment of £10.0.0 costs.
N.6342	Fruit Salad, Canned	Informal	Quantitative order of ingredients found was "Peaches, Apricots, Pears, Pineapple, Cherries" compared with "Pears, Pineapple, Apricots, Peaches, Cherries" declared in the list of ingredients.	Packers agreed to use correct labels in future.
C.8773	Onions, Dried	Private	Appearance of old stock. Contained 38 parts per million of apparent sulphur dioxide. No pungency.	Remainder of stock examined.
N.6403	Condiment, Non- brewed	Informal	Acetic Acid content only 3.7 per cent. w/v. Should 4.0 per cent. w/v.	Manufacturer communicated with and he agreed to check content in future.
E.416	Beef Sausages.	Informal	Contained 205 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
E.418	Desiccated Coconut.	Informal	Contained 64 parts per million of sulphite preservative (expressed as sulphur dioxide).	Vendor communicated with.
S.1193	Ten slices of bread and a fragment of bread.	Informal	Contained part of a small beetle measuring 2 x 1 millimetres.	Bakers cautioned and complainant informed.
N.6438	Channel Islands Milk	Formal	Contained 0.5 I.U's Penicillin per millimetre.	Farmer interviewed and Milk Production Officer informed.
E.492	Ammoniated Mercury Ointment.	Informal	Container did not bear the word "Poison."	Vendor communicated with.
E.493	Ammoniated Mercury Ointment.	Informal	Container did not bear the word "Poison."	Vendor communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.547	Potted Meat	Informal	Contained 9 per cent. excess water and 2 per cent. cereal filler.	Vendor communicated with.
C.8800	Tomato Juice, Canned	Private	Contained 400 parts per million of tin. Recommended maximum limit 250 parts per million.	Remainder of stock destroyed.
E.539	Bread (Part loaf and separately small piece)	Informal	The toasted portion of bread contained a small sliver of glass of the same density as the glass of the Butter Dish (Sample No. M.9498) and exactly matched a cavity which was chipped into the edge of the dish.	Complainant informed.
E.572	Chemical Food B.P.	Informal	Should be labelled "Chemical Food B.P.C."	Vendor notified.
N.6529	Pork Sausages	Informal	Contained 180 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
C.8859	Potted Meat	Informal	Meat content 58 per cent. Sample consisted of slices of meat mould or beef brawn and should not be sold as "Potted Meat."	Manufacturers communicated with.
C.8846	Fruit, Dried (Apricots)	Informal	Contained 2080 parts per million of sulphite preservative (expressed as sulphur dioxide). Limit for dried Apricots is 2000 parts per million.	Vendor communicated with.
S.1237	Beef Steak with Gravy, Canned.	Informal	Meat content only 70.5 per cent. Recommended minimum meat content 75.0 per cent.	Packers communicated with.
N.6589	Pork Sausages.	Informal	Contained 180 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
N.6624	Beef Sausages.	Informal	Contained 225 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.639	Fruit, Dried (Currants)	Private	Contained several living larvae.	Stock examined and destroyed.
S.1307	Braised Steaks in Gravy, Canned	Informal	Meat content only 68·5 per cent. Recommended meat content 75·0 per cent.	Packers communicated with.
C.8923	Channel Islands Milk	Formal	Contained 0·5 I.U's Penicillin per ml.	Farmer interviewed and Milk Production Officer informed.
S.1308	Stewed Steak with Gravy, Canned	Informal	Determined Meat content 75·5 per cent. Can labelled "Stewed Steak with Gravy—65·0 per cent. minimum meat content." The use of such a disclaimer does not accord to the recommendations of the Food Standards Committee Report on Canned Meat.	Vendor communicated with.
E.703	Fruit Salad, Canned	Informal	Quantitative order of ingredients found was "Pears, Apricots, Peaches, Pineapple, Cherries" compared with "Peaches, Pears, Apricots, Pineapple, Cherries" declared in list of ingredients.	Packers communicated with.
C.8971	Vegetables, Dehydrated (Instant Mashed Potato)	Informal	Net weight 3·8 ounces against declaration of 4·0 ounces and contained 60 parts per million sulphite preservative (calculated as sulphur dioxide) but not included in list of ingredients.	Packers communicated with.
E.741	Meat Balls in Tomato Sauce, Canned	Informal	Meat content 54·0 per cent. The recommended minimum limit for canned meat with sauce is 65·0 per cent meat.	Packers communicated with.
C.9048	Beef Sausages.	Informal	Contained 110 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
C.9056	Glauber's Salt, B.P.	Informal	Loss at 100°C. only 0·15 per cent. B.P. limits for loss are 51·5 to 57·0 per cent. Sample had effloresced on storage.	Packers taking steps to prevent recurrence.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.9018	Glauber's Salt, B.P.	Informal	Loss at 100°C. Nil. B.P. limits for loss are 51·5 to 57·0 per cent. Sample had effloresced on storage.	Vendor interviewed and stock destroyed.
C.9166	Pork Sausages.	Informal	Contained 110 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
N.6729	Fruit, Canned (Strawberries)	Informal	Contained permitted artificial food colour. Voluntary statement of ingredients should include a declaration of colour.	Packers communicated with.
E.811	Flour Confectionery	Informal	Contained 11·3 per cent. of total fat of which only one-third consisted of butter fat. Cake labelled "Butter Madeira" which implies that all the added fat is butter fat.	Baker communicated with.
E.834	Bread (one slice)	Informal	Contained a dead house-fly embedded in the crumb of the bread.	Baker cautioned.
C.9161	Glauber's Salt	Informal	Loss at 100°C. 50·0 per cent. B.P. limits for loss 51·5 to 57·0 per cent.	No action advised.
E.889	Beef Sausages.	Informal	Contained 640 parts per million of sulphite preservative (expressed as sulphur dioxide). Maximum sulphur dioxide permitted in sausages 450 parts per million.	Advised formal sample. See No. E.969.
E.891	Fruit, Dried (Mixed)	Informal	Three of the dried Apricots present in the sample had parts of insects adhering to their surfaces.	Remainder of stock examined and found to be in sound condition.
E.894	Soup Mixture, Dry	Informal	Barley present in greater quantity than Beans which were declared before it in list of ingredients.	Vendor communicated with.
S.1483	Pan containing Black Puddings and separately a dead insect	Informal	Contained three unidentified moth or butterfly caterpillars weighing, in all, 19 milligrams.	Prosecution under Section 2 Food and Drugs Act, 1955. Fined £25 and £8.8.0 costs.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.904	Wine, part-full bottle and separately piece of glass.	Informal	Contained one fragment of amber coloured glass weighing 0·10 gramme. A fragment weighing 0·04 gramme was also submitted separately.	Vendor communicated with.
E.946	Beef Sausages.	Informal	Contained 200 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
E.969	Beef Sausages.	Formal	Contained 510 parts per million of sulphite preservative (expressed as sulphur dioxide). Maximum permitted limit is 450 parts per million.	Vendor interviewed and cautioned.
C.9352	Teething Powders	Informal	Each powder contained approximately 29 milligrams mercurous chloride.	Packer communicated with and stock withdrawn from sale.
E.1008	“Buttered” bread with lemon cheese and separately part jar of Lemon Cheese.	Informal	Bread sandwich contained fragment of opaque glass weighing 1 milligram and, submitted separately, a fragment of broken glass weighing 80 milligrams. The part jar of lemon cheese was free from fragments of broken glass.	Complainant informed.
S.1613	Slice of bread containing foreign object.	Informal	Contained a steel sewing needle weighing 0·113 gramme.	Bakers communicated with.
E.1071	Ammoniated Tincture of Quinine, B.P.C.	Informal	Ammonia 0·58 per cent. w/v. B.P.C. limits 0·85 to 1·05 per cent. w/v.	Vendor communicated with and stock withdrawn from sale.
S.1697	Ice Lollies	Informal	Contained 60 parts per million Copper. Recommended general limits are 2 parts per million for beverages and 20 parts per million for other foods.	Food and Drugs Authority concerned communicated with.
C.9510	Cut Mixed Peel.	Informal	Soluble solids by refractometer only 57·4 per cent. Should be not less than 64·0 per cent.	Packers communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.1139	Ammoniated Tincture of Quinine, B.P.C.	Informal	Ammonia 1·15 per cent. B.P.C. limits 0·85–1·05 per cent. w/v.	Vendor communicated with.
E.1147	Pickled Sliced Beetroot.	Informal	Contained a red permitted food colour without declara- tion in list of ingredients.	Manufacturers agreed to amend label.
C.9503	Malt Extract with Cod Liver Oil.	Informal	Contents of Cod Liver Oil 11·1 per cent. Limits for B.P. Malt Extract with Cod Liver Oil 9·3–10·7 per cent.	Manufacturers communicated with.
N.8263	Plain Flour	Private	Creta praeparata only 223 milligrams/100 grammes. Should not be less than 235 milligrams/100 grammes.	No action advised.
N.7308	Part bottle of lemonade	Informal	Deposit consisted of a growth of live yeast which was responsible for the odour of fermentation.	Manufacturers communicated with.
S.1831	Ground Almonds.	Informal	Acid value of extracted oil 18·4. Sample had stale taste.	No remaining stock available.
S.1837	Sweetmeat (Mixed Nuts and and Fruit)	Informal	No walnuts present although these were claimed "as available" in the list of ingredients. No name and address of packer on label.	Manufacturers communicated with.
E.5617	Opened tin of Soup.	Informal	Total solids 10·6 per cent. and Protein 1·85 per cent. These figures would have satisfied the revoked Meat Products Control Order, 1946, but were only approxi- mately 55·0 per cent. of the corresponding values on comparison samples of the same make.	Manufacturers communicated with.
N.7340	Part of a sliced loaf of bread.	Informal	Contained part of a dead house-fly weighing 3·5 milligrams.	Section 2, Food and Drugs Act, 1955. Fined £15 and £7.7.0 costs.
C.9601	Barley	Informal	Infested with psocoptera (book lice)	Packer and vendor communicated with, with a view to surrender of stock.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.7357	Shredded Beef Suet.	Informal	Beef fat content only 75·0 per cent. Should be 83·0 per cent.	Manufacturers communicated with.
N.7379	Sweet Pickle	Informal	Contained 2·5 per cent Salt without declaration in list of ingredients.	Manufacturers communicated with. Correct labels now in use.
S.1872	Pickled Red Cabbage	Informal	No list of ingredients, i.e. vinegar and salt present without declaration.	Vendor communicated with.
E.1227	Cut Mixed Peel	Informal	Contained 0·9 per cent. salt without declaration in list of ingredients.	Packers agreed to to include salt in list of ingredients.
C.9600	Extract of Malt with Cod Liver Oil.	Informal	Contained 11·7 per cent. w/w oil. B.P. limits for oil are 9·3–10·7 per cent. w/w.	Manufacturers communicated with.
N.7384	Part of a sliced loaf of bread.	Informal	Contained approximately 17 grammes of dough discoloured with brown flour.	Baker and complainant informed.
N.7405	Ground Almonds	Informal	Acid value of extracted oil 23·7. Sample had stale flavour.	Vendor communicated with. Remainder of stock withdrawn from sale.
S.1856	Buffered Penicillin Tablets, B.P.C.	Informal	Consisted of Penicillin V Tablets B.P. 125 milligrams and not "Solution-Tablets of Penicillin, Buffered, B.P.C." as prescribed.	Vendor communicated with.
S.1857	Troch. Penicillin B.P.C.	Informal	Contained only 605 units of penicillin per lozenge. (Lozenges of Penicillin B.P.C. should contain not less than 900 units of penicillin).	Vendor communicated with.
E.1268	Meat, Canned	Informal	The opened can of meat showed signs of putrefaction but was otherwise chemically wholesome. The two unopened cans of meat were chemically wholesome.	Complainant informed.
S.1917	Cream of Tomato Soup, Canned.	Informal	Total fat content 3·6 per cent. Fat present contained only 21·0 per cent. of butter fat, yet not other fats declared in list of ingredients on label.	Manufacturers communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
S.1923	Cut Mixed Peel.	Informal	Soluble solids by refractometer only 56·0 per cent.	Same packer as sample No. C.9510.
C.9634	Sweets (Cherry Cobs)	Informal	Labelled “contains 30 per cent. energising liquid glucose.” Suggest claim be amended to “contain the equivalent of 30 per cent. of liquid glucose.”	Manufacturers have agreed to amend label.
N.7442	Ammoniated Tincture of Quinine, B.P.	Informal	Labelled “Ammoniated Tincture of Quinine B.P.” Should be B.P.C.	Vendor communicated with.
N.7443	Ammoniated Tincture of Quinine.	Informal	Ammonia 0·15 per cent. w/v. B.P.C. limits 0·85–1·05 per cent. w/v.	Vendor communicated with and stock withdrawn from sale.
C.9643	Opened tin of Cooked Meat	Informal	Contained a small triangular piece of thin steel plate weighing 10 milligrams.	Section 2, Food and Drugs Act, 1955. Fined £20 and £7·7·0 costs.
N.7447	Pork Sausages.	Informal	Contained 100 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
N.7466	Ammoniated Tincture of Quinine, B.P.C.	Informal	Ammonia 0·57 per cent. w/v. B.P.C. limits 0·85–1·05 per cent. w/v.	Vendor communicated with.
C.9642	Part bottle of Tonic Water.	Informal	Deposit consisted of dead brown sporing bodies of an algae-like fungus. Total volume of deposit 0·03 c.c.	Manufacturers communicated with.
C.9724	Ground Almonds	Informal	Acid value of extracted oil 7·8.	No action advised.
E.1401	Bread	Informal	Contained 16 milligrams of black carbonaceous matter and magnetic oxide of iron. No oil present. Probably derived from oven tray.	Bakery communicated with.
E.1379	Chicken Fillets (Jar)	Informal	Chicken content only 81·0 per cent. Should be labelled “Chicken Fillets in Jelly.”	Importers communicated with.
C.9737	Aspirin Tablets, B.P.	Informal	Contained 0·025 per cent. free salicylic acid in excess of the B.P. limit.	Vendor communicated with.

Table 21—continued.

N.7516	Pork Sausages.	Informal	Meat content only 53·5 per cent. Poor in meat content. Contained 260 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned re preservative.
E.1417	Pork Sausages.	Informal	Meat content only 63·5 per cent.	Slightly low in meat content.
E.1419	Herbs, Mixed, Dried (Culinary)	Informal	Sample musty due to presence of mould and no list of ingredients on label.	Packers communicated with.
C.9751	Part of a sliced loaf of bread.	Informal	Contained one dead house-fly weighing 6 milligrams.	Sections 2 and 113(3) Food and Drugs Act, 1955. Fined £10 and £7.7.0 costs.

THE LABELLING OF FOOD ORDER

The first Labelling of Food Order was made in the year 1944, but it has been amended or re-enacted on several occasions since that time. The Order at present in force is the Labelling of Food Order, 1953, which came into operation on the 5th April of that year and which has been kept in force by the Twelfth Schedule of the Food and Drugs Act, 1955. Five amendment regulations to the Labelling of Food Order, 1953, were made in the years, 1953, 1955, 1958, 1959 and 1961. No amendments to the Order were made during the year under review but the Food Standards Committee is reviewing the whole question of food labelling.

During the year under review 70 samples (34 County and 36 from Autonomous Authorities) were found to contravene the requirements of the Labelling of Food Order. Brief details of the 34 County samples will be found in table 21. Of the total number of samples to which exception was taken 44 (21 County) had labels which did not disclose one or more of the following requirements ; the name and address of the packer, the true name of the food or a correct list of ingredients. In each of the above instances, the packers were communicated with and their attention drawn to the requirements of the Order. During the previous year, 1961, the number of samples which contravened the Labelling of Food Order included 32 County samples and 26 from Autonomous Food and Drugs Authorities. In addition, 4 samples (2 County) submitted during 1962 bore either an incorrect declaration or no declaration of the net weight of the contents and in these instances

either the vendors were communicated with or it was advised that the facts be brought to the notice of the Weights and Measures Inspectors concerned.

In the following paragraphs reference is made to a number of the more interesting samples, in relation to their labels, submitted by County Sampling Officers and by Autonomous Food and Drugs Authorities.

Bubble Gum, Samples Nos. E.61 and E.110 and Chewing Gum, Sample No. 67/62.

The first two samples consisted of prepacked bubble gum of the same source of manufacture submitted by a County Sampling Officer which bore on the label the following list of ingredients " gum base, sugar, glucose, flavour and colour." Upon analysis the sugar (sucrose) content was found to be 69 per cent. while the benzene extract as representative of the gum base was only 13 per cent. Your analyst is of the opinion that where a voluntary list of ingredients is given (sugar confectionery is exempt from the requirement to declare a list of ingredients) then it should be a correct list of all the ingredients in the right order, *i.e.*, with the ingredient used in the greatest proportion being specified first and so on. In this instance " sugar " and not " gum base " should have appeared first in the list. The packers were communicated with and it transpired that the label in question had been supplied by an associated company in the United States of America (where no specific order of ingredients is required). The packers did agree, however, to have fresh labels printed showing the ingredients in their correct order. The informal sample of chewing gum, No. 67/62, was submitted by an Autonomous Food and Drugs Authority and here, again, the sample was found to contain 60 per cent. sucrose and it yielded 18 per cent. of benzene extract. In this instance also " gum base " preceded " sugar " in the list of ingredients given on the label. The importers of this commodity were communicated with and they, in turn, brought this matter to the notice of the manufacturers.

Cough Sweets, Samples Nos. C.9634 and 77.

These two informal samples of the same prepacked product were submitted by a County Sampling Officer and by an Autonomous Food and Drugs Authority respectively. The label on each bore the claim " contain 30 per cent. energising liquid glucose." Upon analysis they were both found to contain 67 per cent. sucrose, 29.5 per cent. liquid glucose solids, 1.6 per cent. moisture and 1.9 per cent. Invert Sugar, etc.

In view of the fact that liquid glucose contains approximately 14 to 21 per cent. of moisture, the amount claimed to be present in the sweets should have been accompanied by some 4·5 to 6 per cent. of moisture. The claim made was not, therefore, strictly correct, although it was obvious that the moisture content had been reduced in the operation of making these boiled sweets. Furthermore, the Foods Standards Committee has stated that it is a mistaken belief that dextrose and liquid glucose have greater nutritional value than sucrose. Having regard to this and the fact that sucrose and not liquid glucose was the main ingredient of the sweets it was felt that the word “energising” in the claim was misleading. The manufacturers concerned had already been approached by another Food and Drugs Authority with regard to the wording on the label of this product and they have agreed to amend the claim to read “contain the equivalent of 30 per cent. of liquid glucose.”

Rice Pudding, Canned, Sample No. 31.

This informal sample submitted by an Autonomous Food and Drugs Authority bore a label which claimed “a corn oil rice pudding, contains no animal fat” and the ingredients were declared as “Rice, Sugar, Skimmed Milk, Corn Oil, Lecithin.” Upon analysis the sample yielded the following results :—Skimmed milk solids 7·4 per cent., rice 6·5 per cent., sucrose 6·0 per cent. and corn oil 3·6 per cent. Skimmed milk contains not less than 8·7 per cent. of milk solids-not-fat; the proportion of skimmed milk solids in this particular sample therefore corresponds to approximately 85 per cent. of skimmed milk. This last ingredient should, therefore, have been placed first and not third in the list of ingredients printed on the label. The manufacturers were communicated with and they agreed to amend the label to include the ingredients in their correct order.

Cakes

The following four samples of cakes were submitted under names which implied that they were made from butter or that they contained cream. Butter Madeira Cake, County Sample No. E.811 was labelled with the words “Butter Madeira” but upon analysis it was found to contain 11·3 per cent. of total fat of which only one-third consisted of butter-fat. In the opinion of your Analyst the name used implied that all the added fat was butter-fat. The bakery concerned was cautioned and it was agreed that the label would be amended to prevent any possible misunderstanding as to the butter content of the cake. An informal sample, No. 173, submitted by an Autonomous Food and Drugs

Authority was described as a butter sponge cake. Upon analysis, however, it was found to contain 25 per cent. of edible fat but butter-fat was entirely absent. In this instance the bakers were cautioned in regard to the name applied to the cake. Informal sample No. 256 was submitted by an Autonomous Food and Drugs Authority as a cream sandwich. The filling of the cake consisted of cream-like material together with both jam and lemon curd. The "cream" filling was found upon analysis to contain 29·5 per cent. of edible fat but no milk-fat was present. The filling was, therefore, only imitation cream and the application of the name "cream sandwich" to this cake was a contravention of Section 47 of the Food and Drugs Act. The vendor was interviewed and cautioned. An informal sample, No. 10497, submitted by another Autonomous Food and Drugs Authority as the result of a complaint had been sold as a "real cream sandwich cake." The filling consisted of cream-like material and jam. Upon analysis the "cream" filling contained 19·7 per cent. of total fat of which only one-third consisted of milk-fat. This sample, therefore, also contravened Section 47 of the Food and Drugs Act. In view of the very definite name under which it had been sold, a formal sample was advised but this has not, so far, been obtainable.

Butter Drops, Samples Nos. E.9729 and E.9772

These are informal and formal samples respectively of the same make of sweets which were submitted by a County Sampling Officer. The informal sample was found upon analysis to contain only 1·14 per cent. of butter-fat and it was coloured with a mixture of two colours. One of the colours was Rhodamine B which is not a permitted food colouring matter. There is also a Code of Practice which was agreed in 1951 between the Ministry of Food and representatives of the Chocolate and Sugar Confectionery trade that, where the word "butter" or a synonym is used in the description of sugar confectionery, the butter-fat content of the products shall be not less than 4 per cent. A formal sample, No. E.9772, was obtained a week later and this when submitted was found to be of a slightly different colour to the original sample. In the case of the formal sample the butter-fat content was found to be 1·4 per cent. and it was coloured with a mixture of three colours, one of which was again Rhodamine B. Two summonses were issued against the vendor and manufacturer of the sweets, one under Section 2 of the Food and Drugs Act in respect of a deficiency in butter-fat and the other under Regulation 5 of the Colouring Matter in Food Regulations, 1957. At the hearing the defendant pleaded "guilty" and was fined £5 5s. 0d. on each summons together with £10 10s. 0d. costs (£21 0s. 0d. in all).

Egg and Milk Flavoured Toffee, Sample No. 223

This informal sample submitted by an Autonomous Food and Drugs Authority was prepacked in a tin which bore a label on which the words "Egg and Milk" and "Toffee" were printed in letters three-tenths-of-an-inch high, while the word "flavoured" was only in letters one-twelfth-of-an-inch high. In addition, the label included a pictorial representation of a farmyard scene including milk-maids, cows and poultry. Upon analysis the sample was found to contain 7 per cent. of whole milk solids and not more than 0.5 per cent. of egg solids. The view was expressed that where a name is qualified by the word "flavoured" the latter should be in the same size print as the remainder of the name; furthermore, pictorial representation of dairy cattle and poultry is not desirable in regard to a "flavoured" product. The manufacturers were communicated with and they agreed to print the word "flavoured" in the same size type as the remainder of the name and to re-design the label.

Butter Creams, Sample No. 4373

This informal sample submitted by an Autonomous Food and Drugs Authority was found upon analysis to contain only 3.65 per cent. of butter-fat. It did not, therefore, comply with the Code of Practice requiring not less than 4 per cent. of butter-fat in sugar confectionery sold under a description which includes the word "butter." The manufacturers were communicated with and a subsequent informal sample taken later in the year was found to be satisfactory.

Cream of Tomato Soup, Sample No. S.1917

This informal sample of canned cream of tomato soup submitted by a County Sampling Officer bore a label which stated it was "made from tomatoes, sugar, butter, cornflour, salt, defatted milk solids, flavouring, spices." Upon analysis it was found to contain 3.6 per cent. of total fat but of this only 21 per cent. (*i.e.*, 0.75 per cent. of the product) was butter-fat. The presence of other fat was, however, not mentioned in the list of ingredients. The Code of Practice for cream soups requires not less than $2\frac{1}{2}$ per cent. of butter-fat; alternatively a product may contain between $1\frac{1}{2}$ – $2\frac{1}{2}$ per cent. of butter-fat if the total fat is not less than 3 per cent., or a product containing no butter-fat, or less than $1\frac{1}{2}$ per cent., must contain not less than $3\frac{1}{2}$ per cent. of total fat. The total fat content present in the sample was, therefore, satisfactory from the point of view of the Code of Practice. The manufacturers were communicated with in regard to the presence of other fat not mentioned

in the list of ingredients. They stated that there had been a change in the recipe and that new labels giving a correct list of the new ingredients were already in use although it would appear that a few of the old labels must have been accidentally used at the time of the change over.

Chicken Fillets, Bottled, Samples Nos. N.6165 and E.1379

These were informal samples of imported bottled chicken fillets of the same brand submitted by County Sampling Officers. Upon analysis they were found to contain only 83 per cent. and 81 per cent. of chicken respectively. There is an agreement with the Food Manufacturers' Federation on the composition and labelling of chopped, minced or flaked poultry, etc., to the effect that where the description is unqualified the product shall contain not less than 95 per cent. of the designated meat, but where the name is qualified by including such phrases as "in jelly" or "in stock" the product shall contain not less than 70 per cent. of meat. (The Food Standards Committee report on canned meat now recommends that meat in jelly should contain not less than 80 per cent. meat.) It was considered that canned or bottled chicken fillets should also conform to the above recommendations. The words "natural jelly" did appear in the list of ingredients on the label but even this qualification of the word jelly is inappropriate where the jelly also includes added water. The fact that reference was made to jelly in the list of ingredients does not preclude the name given to the product from being misleading; indeed, sub-section 6 (5) of the Food and Drugs Act covers this particular point. As a result of correspondence with the importer the foreign packers have now agreed to describe this product as "Chicken Fillets in Jelly."

Ham and Chicken Luncheon, Canned, Sample No. 4487 and Ham and Chicken for Slicing, Canned, Sample No. 4618

These two products of different manufacture were submitted by an Autonomous Food and Drugs Authority. The lists of ingredients given on their respective labels were similar in that one commenced "Ham and Pork, Beef, Chicken Flesh, Farina," while the other stated "Ham, Pork, Beef or Veal, Chicken Flesh, Farina Flour," Upon analysis they were found to contain 73 per cent. and 72.5 per cent. of meat respectively. The opinion was expressed that the first sample should have conformed to the agreement with the Food Manufacturer's Federation and the recommendation of the Food Standards Committee that luncheon meat should contain not less than 80 per cent. meat; and that the latter sample should have been described as a "meat roll" or "meat loaf." Furthermore, both names were considered incorrect

in that no reference was made in the name to “beef” although this ingredient preceded “chicken” in the respective lists of ingredients. The packers of these products were communicated with and they both agreed to amend their labels and to alter their recipes to exclude beef.

Soft Cheese with Shrimps, Sample No, E.9190

This informal sample was submitted by a County Sampling Officer. The sample was in a prepacked carton which was labelled with all the details required by Part II of the Labelling of Food Order. Upon examination the sample was found to consist of soft cheese containing 20 per cent. of fat in which were embedded some ten peeled shell-fish, the total net weight of the commodity being approximately $3\frac{1}{2}$ ounces. The shell-fish, however, had the colour and appearance of peeled prawns rather than shrimps. The packers were communicated with and it transpired that there had been difficulty in obtaining shrimps (the sample was obtained in February) and that prawns had been used as a temporary substitute although it was intended to revert to shrimps as soon as these were obtainable.

Foods Found to Contain Colouring Matter

Three samples were submitted (two by County Sampling Officers) in which permitted artificial colouring matters were present but there was no indication of the presence of colouring matter in the list of ingredients. Canned strawberries, Samples No. E.6729 and 4699. These samples, both of the same brand, were found to contain two permitted food colours (Yellow 2G and Ponceau 4R) but no mention of colouring matter appeared in the list of ingredients. This product had been canned in the United Kingdom and was, therefore, exempt from making a declaration of the ingredients. As already mentioned, however, where a voluntary list of ingredients is given, as in this instance, it is considered that it should be a correct list. The packers were communicated with and they agreed in future to include colouring matter in the list of ingredients. Pickled Sliced Beetroot, Sample No. E.1147. This informal sample was found to contain a permitted food colour (Red 10B) but, here again, no mention of the presence of colour was made in the statutory list of ingredients. The packers concerned were communicated with and it transpired that no artificial colour was added to new season's beetroot but beetroot processed during the winter was coloured. Furthermore, some pickled beetroot prepared for certain export markets did not require a list of ingredients. The appropriate label should have been applied but it would appear that in error a new season's label had been used on a jar of late packed beetroot.

Grilling Mushrooms, Canned, Sample No. 149

This informal sample, submitted by an Autonomous Authority as the result of a complaint, bore a label which used the description "Grilling Mushrooms" and had an illustration of four fully opened mushrooms. The list of ingredients was given as "mushrooms, water, salt." Upon examination the mushrooms were found to amount to 65 per cent. by weight of the contents, the remainder being brine. Furthermore half of the mushrooms were found to consist of button or cup mushrooms, not suitable for grilling and not as depicted in the illustration on the label. The packers were communicated with and they agreed to re-label the product "mushrooms in brine." Incidentally, several further cans were examined by the Weights and Measures Inspector who found that of the declared net weight of the contents, only approximately 50 to 65 per cent. consisted of mushrooms the remainder being brine.

Fresh Coffee, White, with Sugar, More Milk, Sample No. 285

This formal sample, submitted by an Autonomous Food and Drugs Authority was procured from a vending machine. Another sample but without "more milk" was taken on the same occasion. Upon analysis both samples were found to be practically identical as regards fat content (0.03 per cent.) and milk solids-not-fat content (1.2 per cent.). These figures indicated that the sample claimed to contain "more milk" did not, in fact, contain milk but only skimmed milk and even of the latter it did not contain any more than the other sample. Incidentally, the sugar contents of the two samples were 4.3 per cent. and 3.3 per cent. respectively. The representative of the firm on whose premises the vending machine stands has been interviewed, both in regard to the use of the word "milk" when only skimmed milk was being used and in regard to the fact that the machine was not operating correctly and did not, in fact, dispense "more milk" on this occasion.

ICE-CREAM

Until November, 1948, there was no control in this country on the composition of ice-cream. In that month, however, the Ministry of Food decided to allocate additional supplies of sugar, and in some cases fats, to those manufacturers who undertook to include at least 2.5 per cent. fat in their ice-cream. In March, 1951, the first Statutory Standard for ice-cream was made and, except for a short period between July, 1952, and June, 1953, when a slightly reduced standard was temporarily introduced, the minimum standard then laid down was in operation

until April, 1959. This standard required ice-cream to contain not less than 5 per cent. fat, 10 per cent. sugar and $7\frac{1}{2}$ per cent. milk solids other than fat. There were special standards for ice-cream containing fruit and for “ Parev ” (kosher) ice. The required sugar content of ice-cream could be made up of certain other sugars in addition to sucrose but no ice-cream was permitted to contain less than $7\frac{1}{2}$ per cent. sucrose.

When the above standard was first introduced in the year 1951 the Food Standards Committee of the Ministry of Food stated that it was not an ideal standard and that it should be amended and improved as supplies of ingredients became more plentiful. It was not surprising, therefore, that a Food Standards Committee report on the ice-cream standard was published in December, 1957, and that this should be followed by the making of the Food Standards (Ice-Cream) Regulations, 1959, which came into operation on the 27th April, 1959. The standard incorporated in these regulations and which is in force today, is as follows and applies whether or not the ice-cream forms part of a composite article of food :—

“ (a) Ice-Cream shall contain not less than 5 per cent. fat and $7\frac{1}{2}$ per cent. milk solids other than fat so, however, that where ice-cream contains any fruit, fruit pulp or fruit purée it shall either conform to the above standard or, alternatively, the total content of fat and milk solids other than fat shall be not less than $12\frac{1}{2}$ per cent. of the whole including the fruit, fruit pulp or fruit purée, as the case may be, and such total content of fat and milk solids other than fat shall include not less than $7\frac{1}{2}$ per cent. fat and 2 per cent. milk solids other than fat ;

Provided that as respects any ice-cream sold, or offered or exposed for sale under any of the descriptions hereinafter specified or under any such other description as is calculated to lead an intending purchaser to believe that he is purchasing ice-cream of any such description as is so specified, the standard of composition shall be as follows :—

(i) Dairy ice-cream, dairy cream ice or cream ice shall in each case contain not less than 5 per cent. milk fat and no other fat (save as may be introduced by the use as an ingredient of any egg, any flavouring substance or any emulsifying or stabilising agent) and not less than $7\frac{1}{2}$ per cent. milk solids other than fat, so, however, that where any dairy ice-cream, dairy cream ice or cream ice contains any fruit, fruit pulp or fruit purée it shall either conform to the standard of com-

position for that ice-cream, or alternatively, the total content of milk-fat and milk solids other than fat shall be not less than $12\frac{1}{2}$ per cent. of the whole including the fruit, fruit pulp or fruit purée, as the case may be, and such total content of milk-fat and milk solids other than fat shall include not less than $7\frac{1}{2}$ per cent. milk-fat and no other fat (save as may be introduced by the use as an ingredient of any egg, any flavouring substance or any emulsifying or stabilising agent) and not less than 2 per cent. milk solids other than fat.

(ii) Milk ice or milk ice containing any fruit, fruit pulp or fruit purée shall contain not less than $2\frac{1}{2}$ per cent. milk-fat and no other fat (save as may be introduced by the use as an ingredient of any egg, any flavouring substance or any emulsifying or stabilising agent) and not less than 7 per cent. milk solids other than fat.

(iii) “ Parev ” (kosher) ice shall contain not less than 10 per cent. fat and no milk fat or other derivative of milk.

(b) No ice-cream of any description shall contain any artificial sweetener.

In this Schedule—

(a) ‘ artificial sweetener ’ means any chemical compound which is sweet to the taste, and the expression includes polyhydric alcohols but does not include sugar or any other carbohydrate.

(b) each reference to any proportion or percentage means that proportion or percentage by weight.”

It will be noted that there is no minimum standard for sugar content but there is a specific prohibition to the use of artificial sweeteners. The most important change is, however, the introduction of the special standards for dairy ice-cream, dairy cream ice, cream ice and milk ice which are all required to contain specified minimum amounts of milk-fat, the use of other types of fat not being permitted in these varieties of ice-cream.

On the same day that this standard came into operation an amendment to the Labelling of Food Order also came into force and this introduced requirements as to the labelling of ice-cream. It is illegal

to label or advertise ice-cream by means of words or pictorial devices suggestive of butter, cream, milk or anything connected with the dairy interest unless the ice-cream contains no fat other than milk-fat. The label or advertisement may, however, bear a statement to the effect that the ice-cream contains skimmed milk solids. It is also an offence to sell under the description "ice-cream" any prepacked ice-cream which contains fat other than milk-fat unless the wrapper also bears in letters of a specified height either the declaration "contains non-milk-fat" or, if appropriate, the declaration "contains vegetable fat." The above requirements also apply to ice-cream which forms part of a composite article of food.

A third regulation concerning both ice-cream and certain types of ice-lollies also came into operation on the 27th April, 1959, i.e., the Ice-Cream (Heat Treatment, etc.) Regulations, 1959. These regulations consolidate and amend the Ice-Cream (Heat Treatment) Regulations, 1947 to 1952. The regulations require the ingredients of ice-cream after mixing to be either pasteurised or sterilised by one or other of the following methods :—

Pasteurisation

"Method I. The mixture shall be raised to and kept at a temperature of not less than 150° Fahrenheit for at least 30 minutes.

Method II. The mixture shall be raised to and kept at a temperature of not less than 160° Fahrenheit for at least 10 minutes.

Method III. The mixture shall be raised to and kept at a temperature of not less than 175° Fahrenheit for at least 15 seconds.

Sterilisation

The mixture shall be raised to and kept at a temperature of not less than 300° Fahrenheit for at least 2 seconds."

Before heat treatment the mixture shall not be kept for more than one hour at any temperature which exceeds 45°F. and after heat-treatment it shall be cooled to not more than 45°F. within 1½ hours and kept at this temperature until the freezing process is carried out. After freezing the ice-cream shall be kept at a temperature not exceeding 28°F. ; if its temperature does exceed this figure it must again be heat-treated before being re-frozen.

The above requirements as to pasteurisation or sterilisation do not apply to the use of a complete cold mix reconstituted with drinking

water if the mixture is made into ice-cream within one hour of reconstitution. The requirements also do not apply to any mixture (whether containing milk solids or not) used, either alone or with other mixtures, in the manufacture of water ice or similar products if the mixture has a pH value of 4·5 or less. It is considered that such products are sufficiently acid to prevent the growth of harmful bacteria without heat-treatment.

It will be noted from table 22 that the average fat content of ice-cream during the year under review was 9·1 per cent. and this is only slightly below the figure recorded for the previous year so that the general improvement in the fat content of ice-cream found over the last 14 years, has been maintained. A perusal of the table shows that the average fat content in 1946 was only 2·3 per cent. whereas for 1962 it was 9·1 per cent. Furthermore the lowest fat content found during 1962 was 3·3 per cent. ; whereas in the four years 1946 to 1949 fats as low as 0·3 and even 0·1 per cent. were found. Table 22 shows the results for all samples of ice-cream examined in the County Laboratory whether submitted by County Sampling Officers or by Autonomous Food and Drugs Authorities.

During the year 1962, 121 samples of ice-cream (excluding samples of dairy ice-cream and milk ice) were submitted for chemical analysis, 68 by County Sampling Officers and 53 by Autonomous Food and Drugs Authorities. Of these, three samples were reported upon adversely. In the year 1961, the number of samples reported upon adversely was also three. Of the three unsatisfactory samples (two County) one was deficient in fat, but a subsequent formal sample was found to be genuine, one was slightly deficient in milk solids other than fat, while the remaining sample (from an Autonomous Food and Drugs Authority), contained a splinter of wood. Details of the two incorrect County samples together with the action taken will be found in table 21.

The average figures found for the 121 samples were—total solids 35·1 per cent. (maximum 50·5 ; minimum 24·8) and for fat content 9·1 per cent. (maximum 13·3 ; minimum 3·3). These figures as will be seen from the following table, which includes figures for the last 17 years, show that the big improvement in composition noted in the year 1950 has been maintained. It will be remembered that prior to the war a figure of eight per cent. was suggested by a trade association as a minimum standard for fat content and it is interesting to note that during the year under review, 79 samples out of the total of 121 showed fat contents varying from 8·0 to 13·3 per cent.

Table 22
Ice-Cream

YEAR	Number of Samples	Fat Content Average %	Total Solids Average %	Highest Fat %	Lowest Fat %	Highest Total Solids %	Lowest Total Solids %
1946	45	2.3	22.5	10.7	0.1	36.8	13.3
1947	59	3.0	23.6	10.6	Less than 0.1	39.2	14.1
1948	53	3.9	25.3	11.3	0.1	33.4	18.9
1949	171	6.4	29.3	13.3	0.3	45.9	14.7
1950	186	8.5	32.1	14.7	2.2	43.0	20.1
1951	230	8.6	32.6	15.6	3.3	40.7	23.0
1952	143	9.0	32.8	13.7	2.0	40.0	19.6
1953	130	8.6	32.7	15.2	2.5	42.3	23.3
1954	90	9.2	34.6	13.8	3.1	44.0	24.8
1955	95	8.1	33.2	13.3	3.5	40.9	24.3
1956	94	9.2	34.0	16.4	3.6	43.6	26.3
1957	99	8.7	33.3	14.7	3.0	41.9	22.9
1958	111	8.9	33.8	15.6	2.7	42.1	25.3
1959	104	8.9	34.6	17.4	4.6	55.2	27.4
1960	68	8.7	35.4	12.4	4.1	50.7	25.8
1961	114	9.7	35.7	14.8	4.6	50.1	27.1
1962	121	9.1	35.1	13.3	3.3	50.5	24.8

Dairy Ice-Cream

Seventeen samples (15 County) of dairy ice-cream, not included in the foregoing table, were also submitted for chemical analysis. The average figures found for the 17 samples were—total solids 35.6 per cent. (maximum 39.6 ; minimum 32.4) and for milk fat content 10.4 per cent. (maximum 13.1 ; minimum 5.1). All the samples were found to be satisfactory.

Milk Ice

Three samples were submitted, all by the same Autonomous Food and Drugs Authority, during the year under review and they were all

reported as genuine. The average figures found for the three samples were :—total solids 31·3 per cent. (maximum 32·2 ; minimum 30·7) and for milk fat 3·6 per cent. (maximum 4·2 ; minimum 3·1).

ICE LOLLIES

During the year under review 25 samples of ice lollies were submitted for examination under the Food and Drugs Act. Twenty-four of the samples were submitted by County Sampling Officers, and one sample by an Autonomous Food and Drugs Authority. Unlike ice-cream there is no statutory standard for the composition of ice lollies. They are specifically excluded from the provisions of the Food Standards (Ice-Cream) Order while the Food Standards (Soft Drinks) Order refers only to liquid soft drinks, although ice lollies are, in general, similar in composition to soft drinks. Ice lollies and ice-cream are, however, both mentioned, indirectly or directly, in the Arsenic in Food Regulations and in the Lead in Food Regulations which were published in the years 1959 and 1961 respectively. In these, maximum limits of only one part per million for lead and 0·5 part per million for arsenic (as As) are specified for both commodities (the standard of one part per million for lead in ice lollies to become 0·5 part per million on the 20th April, 1964). The limits for the majority of other foods are two parts per million and one part per million respectively. In addition to the statutory limits for lead and arsenic referred to above there are also recommended maximum limits for two other toxic metals in foods generally, viz., copper 20 parts per million and zinc 50 parts per million. In view of the more stringent figures adopted for lead and arsenic in ice lollies and in ice-cream than in other foods, lower limits for copper and zinc might also be desirable for these particular types of commodities. Of the 25 samples of ice lollies, one County sample was reported upon adversely. Informal sample, No. S.1697, was obtained from the stock in a shop following the examination of a miscellaneous sample, No. M.9559, which had been submitted on complaint. Both samples were found to contain excessive amounts of copper due to their manufacture in untinned copper moulds. Details of these samples will be found in table 21 and in the sections of this report dealing with metals in foods and with miscellaneous samples.

The total solids (sugars, etc.) in the samples ranged from as little as 3·4 per cent. to 28·9 per cent. with an average for the 25 samples of 13·6 per cent. The average total solids for the 36 samples examined in the previous year was 20·0 per cent. while the average for 14 samples analysed in 1960 was 14·6 per cent.

SAUSAGE, MEAT PASTE AND FISH PASTE

The last of the Meat Products Orders, which was revoked on the 1st March, 1953, in addition to controlling the price and meat content of sausages also prohibited the use of certain specified offals in the preparation of sausages and other uncooked open meat products intended for human consumption. The restriction on the use of these offals was re-enacted in the Offals in Meat Products Order, 1953, but no Food Standards Regulations have been made to replace the requirements as to composition laid down in the Meat Products Orders. There is, therefore, now no statutory standard for the meat content of sausages.

The compositions of meat paste and of fish paste, however, are controlled by the Food Standards (Meat Paste) Order, 1951, and the Food Standards (Fish Paste) Order, 1951. The standard for meat paste is a minimum of 55 per cent. meat and for fish paste a minimum of 70 per cent. fish. The standards apply to both imported and home produced products.

During the year 1962 148 samples of sausages, one of sausage meat, eight of canned sausage, three Cumberland sausage and four Continental-type sausage were examined as against 106 samples of sausage and twelve of canned sausage, etc., in the previous year. One hundred and sixteen samples of sausage were examined for the County (including four of canned sausage) while the remainder of the samples were examined for Autonomous Food and Drugs Authorities. Of the total number of sausage samples submitted during the year under review 67 consisted of beef (including one sausage meat) and 82 of pork sausage. Thirty-four County samples and thirteen submitted by other Food and Drugs Authorities were reported upon adversely. Thirty-two of the unsatisfactory samples, including twenty-three County samples, contained normal amounts of sulphite preservative but without any declaration of the presence of preservative being made on the label or exhibited in the shops concerned. This is contrary to the requirements of Regulation 5 (1) and Schedule 3 of the Preservatives in Food Regulations, 1962. In addition, two County samples obtained from the same shop contained more than the permitted amount of preservative and the vendor was cautioned.

It is interesting to note that the average meat content of 66 samples of beef sausage examined in the County Laboratory during the year 1962 was 60·0 per cent., while the average meat content of the 82 samples of pork sausage examined over the same period was 69·0 per cent. Bearing in mind that the standard before the 1st March, 1953, under the

Commodity Control Order, were a minimum of 50 per cent. meat for beef sausage and beef sausage meat and a minimum of 65 per cent. meat for pork sausage and pork sausage meat, the average figures obtained in the County Laboratory during the year 1962, can be regarded as satisfactory. In fact, the average meat content of the beef sausages examined in 1962 is the same as the figure for the year 1961, and none of the samples showed a meat content of less than 50·0 per cent. With regard to pork sausage the average meat content, as already mentioned, was 69·0 per cent. as against 65·0 per cent. in the year 1961 but twelve of the samples (or 15 per cent.) submitted during the year under review contained less than 65 per cent. of meat. Eight of the twelve samples of pork sausage poor in meat content consisted of County samples. It will be seen from an examination of table 21 that the majority of these consisted of samples which might be regarded as only slightly low in meat in that they had meat contents of between 60 to 65 per cent. Although the number of pork sausage samples found to be poor in meat content cannot be regarded as satisfactory it must be emphasised that it should not be assumed that the position with regard to pork sausage has deteriorated since control was removed at the beginning of the year 1953. Fifty per cent. of the pork sausage samples submitted in each of the years 1951, 1952 and 1953 were reported upon adversely and the proportions of unsatisfactory samples for the years 1957, 1958, 1959, 1960 and 1961 were 26 per cent., 12 per cent., 20 per cent., 16 per cent. and 21 per cent. respectively. The remaining unsatisfactory sample of pork sausage was from a delivery under contract to a school meals kitchen. This was found upon analysis to contain a higher proportion of fat than is permitted by the County Council specification. Details of all the unsatisfactory County samples, together with the action taken, will be found in table 21.

Twenty-seven samples of meat paste (21 submitted by County Sampling Officers and six by Autonomous Authorities) were examined during the year and all were found to be satisfactory.

With regard to fish paste, 49 samples (37 County) were submitted for examination during the year, only one of these was reported upon adversely. This sample, No. S.340, contained starch although this was omitted from the voluntary list of ingredients. The manufacturers were communicated with and they gave an assurance that they would use correct labels in future.

METALS IN FOODS

The toxic metals for which samples of foods are normally examined are Lead, Copper, Zinc and Tin. All varieties of foods for which it is considered that there is a risk of possible metallic contamination during manufacture are examined for all or some of the above as a matter of routine. The list is a long one and includes all types of canned foods, sugar and chocolate confectionery, soft drinks, ice-cream, ice lollies, fresh fruit, wines, gelatine and table jellies, tomato products, sauces, pickles, etc. As the result of the making of the Lead in Food Regulations, 1961, statutory limits for the maximum amounts of lead permitted in foods have been in force since April of the year under review. The general limit prescribed is 2 parts per million but there is quite an extensive list of specified foods for which lower or higher limits are prescribed; these range from as little as 0.2 part per million for certain non-alcoholic beverages to as much as 50 parts per million in the case of solid pectin. As regards the other metals the only statutory limits are those of 30 parts per million for copper and 100 parts per million for zinc prescribed for edible gelatine in the Food Standards (Edible Gelatine) Order, 1951; the limit of 20 parts per million for copper in tomato ketchup or sauce prescribed in the Food Standards (Tomato Ketchup) Order, 1949, as amended, and the limit of 3 parts per million copper (in the form of copper carbonate) in pears prescribed by the Preservatives in Food Regulations, 1962. There are, however, other maximum limits which have been recommended by the Food Standards Committee and which are usually accepted as working standards by the food trade and by public analysts. The Food Standards Committee report on tin in canned foods published in 1952 recommended a maximum limit of 250 parts per million but did not make any recommendation with regard to foods and beverages which had not been canned nor did they advise that the limit should be made statutory. The Food Standards report on Zinc published in 1954 also did not advocate statutory standards (apart from that for edible gelatine) but recommended that the maximum limit for zinc in beverages ready-to-drink should be 5 parts per million and in other foods 50 parts per million. Finally the report on copper, published in 1956, advocated general limits of 2 parts per million in certain beverages and 20 parts per million in other foods but a list of special limits for certain foods was also included in the report.

During the year under review 16 samples were reported upon adversely due to the presence of one or other of the above mentioned metals. Four of these samples were submitted by County Sampling Officers. An informal sample (No. 10513) of imported chocolate

liqueurs submitted by an Autonomous Food and Drugs Authority was found upon analysis to contain 4 parts per million of lead. Even after allowing for the presence of the equivalent of approximately 15 per cent. of dry fat free cocoa (which is permitted to contain 5 parts per million of lead) the amount of lead found in the sample was too high by approximately 1.4 parts per million and the attention of the importers was drawn to this matter. Two samples of sloe gin (No's. 241 and 246) of the same manufacture, submitted by an Autonomous Food and Drugs Authority, were found to contain 2.4 and 2.3 parts per million of lead respectively. The maximum limit laid down for lead in liqueurs is 1.0 part per million. In correspondence with the packers it appeared probable that this particular stock had been bottled before the Lead in Food Regulations, 1961, were made. No further stock existed and the packers stated that they were aware of the requirements of the regulations and that these would be fulfilled in future. An informal sample of vinegar from pickled beetroot (No. 72) submitted by an Autonomous Food and Drugs Authority was found to contain 3 parts per million of lead, i.e., one part above the permitted limit. Two further informal samples of the same brand of pickled beetroot were obtained subsequently from two different retail shops but upon examination these were found to contain no lead. A sample of tea beverage from a vending machine (No. 287), also submitted by an Autonomous Food and Drugs Authority, was found to contain 0.7 part per million of lead, the permitted limit for ready to drink non-alcoholic beverages being only 0.2 part per million. Subsequently, a sample of the instant tea powder used was examined and found to contain 0.7 part per million of lead, which is satisfactory, and a sample of the water used was found to contain 0.25 part per million of lead, the usually accepted maximum limit for water being 0.3 part per million. The vendor was interviewed and it appeared that the original result might have been due to water having stood for some considerable time in contact with some lead piping. A sample of home made plum jam (No. 4589) which was stated to have caused illness was submitted by an Autonomous Food and Drugs Authority and it was found upon analysis to contain 5.1 parts per million of lead and 75 parts per million of copper. Both metals were present in excessive amounts and the remainder of the stock was surrendered and destroyed. This jam had an acidity of 1.09 per cent. (as citric acid) which is a little higher than usual and it was made in the brass preserving pan (No. M.9597) described in Part VI of this report.

No samples were reported against with regard to zinc contamination but, in addition to the above mentioned sample of jam, three County

samples were reported upon adversely in respect to copper contamination. An informal sample of treacle toffee (No. E. 9284) was found to contain 27 parts per million of copper, i.e., 7 parts above the recommended limit, and an informal sample of canned dressed crab (No. N.8021) was also found to contain 27 parts per million copper, although in this latter case it was possible that it was naturally present in the fish. The manufacturers of the treacle toffee make this product in copper pans and had in the past scraped the hot residue from the pan with a palette knife which action might help to contribute to the copper content of the toffee. An informal sample of ice lollies (No. S.1697), taken in connection with the miscellaneous sample (No.M.9559) mentioned in Part VI of this report, was found upon examination to contain 60 parts per million of copper. As stated in regard to the miscellaneous sample the presence of copper was traced to the use of untinned copper moulds for making the lollies.

With regard to tin contamination two samples of the same brand of imported canned melon in syrup (No's 4352 and 4370) submitted by an Autonomous Food and Drugs Authority were found upon analysis to contain 590 and 505 parts per million of tin respectively. These figures represent a considerable excess over the recommended limit of 250 parts per million and the remainder of the stock was surrendered and the importers communicated with. An informal sample of canned tomato juice (No. C.8800) submitted by a County Sampling Officer was found to contain 400 parts per million of tin and the remainder of the small stock was destroyed. Two informal samples of canned sardines in tomato sauce (No's. 242 and 255) were of the same brand and the same delivery to a retailer in the area of an Autonomous Food and Drugs Authority. The samples were found to contain 400 and 296 parts per million of tin respectively and the remainder of the stock was withdrawn from sale. The same food and drugs authority submitted two further samples of another brand of canned sardines in tomato and olive oil (No's. 262 and 275) from a retailer's stock. These were found to contain 400 and 540 parts per million of tin respectively and the stock was surrendered and destroyed and the packers were communicated with. Another sample taken from stock on the premises of the wholesaler who supplied the last mentioned retailer was found to contain 230 parts per million of tin and, therefore, just complied with the recommended limit.

SAMPLES CONTAINING INSECTS OR INSECT REMAINS.

Twenty-three food and drugs samples (18 County) were found to contain insect or insect remains during the year under review. The corresponding number for the year 1961 was 28 (22 County) samples.

In addition, one County sample was submitted as a miscellaneous sample and is mentioned in Part VI of this report. The insects found in the samples included various beetles, house-flies, blow-flies, midges, cocoa and other moth larvae, moth, book-lice and caterpillars. Brief accounts of five County samples which were the subject of prosecutions are given in the following paragraphs.

Fragments of Fish Cake, Sample No. S.943.

This informal sample submitted on complaint by the purchaser weighed approximately one ounce. Some of the fragments bore the original external coating of breadcrumbs, which latter were dyed yellow with permitted coal tar colours. Upon examination part of the body of a blow-fly (comprising the thorax, one leg, one wing and a small part of the abdomen) was found partially embedded in a piece of the interior of the fish cake, the attached wing being completely embedded. As a result of the examination of this sample the opinion was expressed that the blow-fly was present in the fish cake at the time of manufacture. Legal proceedings were instituted against the vendors of the fish cake under Section 2 of the Act and they, in turn, issued a summons under Section 113 (1) of the Act against the manufacturers alleging that the latter were responsible for the offence. At the hearing of the case the vendors pleaded "not guilty" and were acquitted but the manufacturers who pleaded "guilty" were fined £5 together with £13.2.0 costs (£18.2.0 in all).

Corned Beef, Sample No. E.388.

This complaint sample consisted of an opened seven ounce size can of imported corned beef which only contained two-fifths of an ounce of corned beef when submitted for examination. A dark reddish-brown to black beetle measuring 13 millimetres long and weighing 77 milligrams was found to be partially embedded in, and firmly attached to the meat. The beetle was not definitely identified as to species but it belonged to the family of dung beetles and chafers (Scarabaeidae) which are outdoor beetles not normally associated with food infestation, their presence in food being accidental. A phosphatase test carried out on the beetle and its appearance were consistent with it having been present in the meat before it was canned and processed. The retailer had bought this corned beef from a wholesaler who, in turn, had been supplied by the packers. A summons was issued against the packers under Section (2) and Section 113 (3) of the Food and Drugs Act. At the hearing the firm pleaded "guilty" but was given an absolute discharge on payment of £10.0.0 costs.

Black Puddings, Sample No. S.1483.

This informal sample consisted of one pound of black puddings which had been purchased by the complainant. After cooking, they had been served for a meal but on cutting the first one open an insect about 9 millimetres long was found embedded inside. This and the black puddings were submitted for examination. Two further similar insects were found each inside a separate whole black pudding. The insects proved to be moth or butterfly caterpillars and it was found that they had been feeding on the culinary herbs used in the manufacture of the black puddings rather than on the groats or onion which were also present as ingredients. The puddings had been sold direct to the complainant by the makers against whom legal proceedings were instituted under Section 2 of the Act. At the hearing the defendant firm pleaded "guilty" and was fined £25 and £8.8.0 costs (£33.8.0 in all).

Bread, Samples No's. N.7340 and C.9751.

Both these samples consisted of portions of sliced loaves of bread made by different bakeries but each was the subject of a similar complaint. Sample No. N.7340 was found to contain part of the body of a house-fly embedded in the crumbs of one of the slices while sample No. C.9751 was found to contain a house-fly in parts embedded in two adjacent slices of the bread. In both instances the flies were present in the loaves before they were baked. Sample No. N.7340 had been purchased by the complainant concerned from a retail shop which had obtained the bread from a firm of bakers. Legal proceedings were instituted against the bakers under Section 2 and Section 113 (3) of the Act. At the hearing the firm pleaded "guilty" and was fined £15.0.0 and £7.7.0 costs. Similar circumstances surrounded the purchase of sample No. C.9751 and the bakers of this bread were also prosecuted under the same sections of the Food and Drugs Act. This firm also pleaded "guilty" and was fined £10.0.0 together with £7.7.0 costs.

SAMPLES CONTAINING EXTRANEIOUS MATTER.

During the year under review 47 food and drug samples (34 County) were reported upon adversely because they were found upon examination to contain extraneous matter. The corresponding number in the year 1961 was 65 samples (49 County). In addition, a further three County samples, found to contain extraneous matter were submitted

under the heading of miscellaneous samples and are mentioned in Part VI of this report. Of the 47 food and drug samples, 12 (10 County) were samples of milk, the remainder consisted of various types of foods. The wide range of extraneous matter found in the samples included :— broken glass, steel plate, steel nut, cigarette, spent match, burnt farinaceous matter, magnetic oxide of iron, aluminium filings, sewing needle, fungus, sand, cotton and rayon cloth, mineral oil, cartilage, soapless detergent, drinking straw, traces of dung in milk, phenols, splinter of wood, jute fibres, hypochlorite solution, and used chewing gum. Brief details of five County samples which were the subject of legal proceedings are given below.

Milk, Sample No. S.10.

This sample received on complaint was submitted in a one pint milk bottle which then only contained approximately two-thirds of a fluid ounce of milk. The milk bottle was not in any way chipped or broken but three thin flakes of broken glass were found in the milk. These fragments of glass were respectively 11, 8 and 6 millimetres long and their density was 2·500. The density of the glass of the bottle itself was very similar and was 2·496. The sample consisted of pasteurised milk which had been delivered to the customer by a roundsman of a dairy company. Legal proceedings were instituted against another dairy company, which had actually processed and bottled the milk, under Section 2 and Section 113 (3) of the Food and Drugs Act. At the hearing of the case the defendant company pleaded “ guilty ” and was fined £15.0.0 together with £7.7.0 costs (£22.7.0 in all).

Mince Tarts, Sample No. E.5608.

This informal sample, submitted on complaint, consisted of two mince tarts, one of which was entire but a piece had previously been removed from the other. The whole tart was satisfactory but a partially smoked cigarette was found embedded in the part mince tart. The smoked cigarette was 0·9 inch long and was found embedded in the interior surface of the bottom pastry of the tart underneath the mince-meat filling. The complainant had purchased the tarts from a market stall owned by two partners who were also the bakers. At the hearing of the case both defendants pleaded “ guilty ” but after the evidence had been heard they were given an unconditional discharge although they were ordered to pay £7.15.0 costs.

Cake, Sample No. N.5933.

This sample consisted of part of a small cake weighing one ounce. It had a currant-cake filling placed on pastry and topped with icing. The sample had been submitted as the result of a complaint by the purchaser. Upon examination a piece of partially charred wood, 1·4 inches long, of the nature of a spent match, was found embedded in the currant cake filling. The spent match contained 3 per cent. of absorbed sugar and the uncharred portion was much darker in colour than a new match. It was found that a match inserted in the currant cake overnight was not appreciably stained and it only absorbed about 0·4 per cent. of sugar. The findings in respect of the spent match found in the sample were not, therefore, inconsistent with it having been in the cake when it was baked and before it was purchased by the complainant. The sample had been sold by a retail confectioner, who was supplied through a wholesale firm who, in turn, obtained the cake from a firm of bakers. A prosecution was instituted against the bakers concerned under Section 2 and Section 113 (3) of the Food and Drugs Act and at the hearing the defendant company pleaded “ guilty ” and was fined £10 and £7.7.0 costs (£17.7.0 in all).

Part Loaf of Bread, Sample No. C.8560.

This informal sample, submitted on complaint, consisted of one end of a round or oval loaf. The piece measured approximately 5 x 2 x $1\frac{1}{4}$ inches and was of the nature of granary bread, i.e. it contained some whole or kibbled grains of wheat. A hexagonal galvanised steel nut measuring approximately 0·44 inch by 0·22 inch and weighing 3·13 grammes was found embedded in a cavity in the crumb of the sample. The nut was a $\frac{1}{4}$ inch B.S.F. nut and it was in good condition when found. The bread had been purchased at a branch shop used by a firm of bakers. A prosecution was instituted under Section 2 of the Act and the defendant company pleaded “ guilty ” and were fined £5.0.0 together with £6.6.0 costs (£11.6.0 in all).

Chopped Meat, Canned, Sample No. C.9643.

This complaint sample consisted of an opened 12 ounce can of meat. Three slices had already been cut when the sample was received but these were submitted together with the remainder of the meat. A small piece of thin steel plate, weighing 10 milligrams, was partially embedded in the cut surface of the third slice and was surrounded by a brown discoloured area of the meat. There was a similar discoloured

area in the corresponding position in the cut surface of the main portion of the meat. The discoloured area was found to contain 240 parts per million of iron whereas only 4 parts per million were present in the unstained parts of the meat. The steel plate was only 0·3 millimetres thick and was identical in thickness with the metal of the can itself. Furthermore, one side of the steel bore part of a letter printed in white on a blue ground together with some yellow colouring and these colours were also present on the label printed on the can itself. As a result of the examination of this sample the opinion was expressed that the small piece of steel plate was present in the meat before the can was opened and that its appearance was consistent with it having originally been derived from a similar type of can to that containing the sample. The sample had, of course, been purchased by the complainant at a retail shop but legal proceedings were instituted against the actual packers of the meat under Section 2 and Section 113 (3) of the Food and Drugs Act. At the hearing the firm concerned pleaded "guilty" and was fined £20.0.0 together with £7.7.0 costs (£27.7.0 in all).

COD-LIVER OIL AND MALT EXTRACT WITH COD-LIVER OIL

The above-mentioned commodities are the subject of monographs in the British Pharmacopoeia, 1958. With regard to standards, the British Pharmacopoeia requires Cod-Liver Oil to contain not less than 600 Units of Vitamin A activity per gramme and not less than 85 Units of Antirachitic activity (Vitamin D) per gramme. The assay of Vitamin A activity is carried out by the spectrophotometric method described in the B.P. Addendum, 1960, while the Vitamin D is determined by biological assay. Malt Extract of the B.P. is required to contain nitrogen equivalent to 4·0 per cent. w/w of protein and to pass a limit test for Lipase while Malt Extract with Cod-Liver Oil must contain 10·0 per cent. w/w of Cod-Liver Oil (limits 9·3 to 10·7 per cent.) and must have not less than 60 units of Vitamin A activity in one gramme. It should be noted that while the maximum limit for the acid value of Cod-Liver Oil, per se, is 1·2, the limit for the acid value of the oil obtained in the assay of Malt Extract with Cod-Liver Oil is 10.

During the year under review 13 samples of Cod-Liver Oil, one sample of Cod-Liver Oil Capsules, 13 samples of Malt Extract with Cod-Liver Oil, one sample of Extract of Malt with Halibut-Liver Oil and one sample of Malt Extract and Vitamin Compound were submitted for examination. With the exception of one sample of Cod-Liver Oil and three samples of Malt Extract with Cod-Liver Oil, which were submitted by Autonomous Food and Drugs Authorities, all the remaining samples were submitted by County Sampling Officers. Only three

samples were reported upon adversely and these all consisted of samples of Malt Extract with Cod-Liver Oil. The sample of Cod-Liver Oil Capsules complied with the declaration on the label both as regards cod-liver oil content and the Vitamin A potency of the oil. The sample of Malt Extract and Vitamin Compound bore a declaration of the ingredients and a statement of its Vitamin A potency, together with its content of certain Vitamins of the Vitamin B complex and of its content of minerals. Upon analysis it was found to comply with the declarations on the label. The sample of Malt Extract with Halibut-Liver Oil complied with the standard given for this commodity in the B.P.C. 1959, i.e. its Vitamin A potency was found to be not less than 60 units per gramme.

Informal Sample No. C.9503 of Malt Extract with Cod-Liver Oil, submitted by a County Sampling Officer was found to contain 11.1 per cent. of Cod-Liver Oil which is a little above the maximum limit of 10.7 per cent. specified by the B.P. On correspondence with the manufacturers they were, at first, reluctant to admit that this particular batch did not comply with the B.P. limit. Eventually, however, they agreed that, in future, more attention would be paid to the careful mixing of the ingredients. Informal Sample No. C.9600 of Malt Extract with Cod-Liver Oil was also submitted by a County Sampling Officer and this was also found to have a high content (11.7 per cent.) of Cod-Liver Oil. The manufacturers of this product were communicated with and it transpired that when this batch was made a low result for oil content had been obtained by the works' chemist. In view of the fact that all ingredients used in a mix are weighed this low result was most unusual. Without verifying his result by a repeat analysis, however, he added additional Cod-Liver Oil to the mix, with the result that the finished batch had contained an excess of oil. This had not been noted until the firm were informed of the result obtained on our sample. The last unsatisfactory sample of Malt Extract with Cod-Liver Oil, No. 220/62, was submitted by an Autonomous Food and Drugs Authority. The Cod-liver oil content was satisfactory but the sample had been purchased in a jar bearing a declaration of the net weight of the contents but it was otherwise unlabelled; i.e. although prepacked there was no name of the food or name and address of the packer. The Malt Extract with Cod-Liver Oil had been supplied to the retailer by a wholesale firm who stated that it is normally labelled correctly with the name of the food and their own name and address and they were unable to account for this particular delivery to the retailer being unlabelled. Although Malt Extract with Cod-Liver Oil is the subject of a monograph in the British Pharmacopoeia this does not mean that, because it is capable of being used as a medicine, it

shall not be regarded as a food. As a food it comes, of course, within the requirements of the Labelling of Food Order.

PENICILLIN TABLETS

Penicillin preparations may normally only be purchased on medical prescription but the Therapeutic Substances (Supply of Substances for Analysis) Regulations, 1958, permit certain persons, including Public Analysts and Sampling Officers authorised under the Food and Drugs Act, to obtain these preparations for the purposes of analysis.

The British Pharmacopoeia, 1958, and its Addendum, 1960, lists three official tablets of compounds of Penicillin.

Penicillin Tablets B.P. are prepared with Benzylpenicillin (Crystalline Penicillin G) in the form of the Potassium or sodium salt. Unless stated otherwise these tablets each contain 200,000 units. The unit at present in use being the specific activity contained in 0.0005988 milligram of the standard preparation of the dried crystalline sodium salt of Benzylpenicillin. The official assay of this tablet is carried out micro-biologically using a susceptible strain of *B. subtilis* and comparing the dose of the sample with the dose of a standard preparation of penicillin which produces the same degree of inhibition of the micro-organism. A maximum limit for moisture content (1.0 per cent.) is also prescribed and the following note with regard to storage is included in the official monograph :—“Tablets of Penicillin are packed in a suitable well-closed container which prevents the access of moisture and should be stored in a cool, dry place. They deteriorate on exposure to moist air.”

Benzathine Penicillin (Benzathine Penicillin G) tablets B.P. unless otherwise stated contain 200,000 units per tablet. This compound is NN'-dibenzylethylenediamine di-(benzylpenicillin) and it is only very slightly soluble in water and in other common solvents. Because of its low solubility it is relatively stable in gastric juice or blood serum and the penicillin is only slowly released when it is given by mouth or by intramuscular injection. For these same reasons it will, however, maintain an effective concentration in the blood for relatively long periods, particularly if administered by the latter method. The official assay is the same micro-biological method as that for Penicillin Tablets B.P. using the same standard preparation of penicillin; the only difference being that, because of the low solubility in water, the weighed portion of the sample is first dissolved in dimethylformamide before diluting with solution of standard pH 7.0.

Phenoxymethylpenicillin (Penicillin V) Tablets unless otherwise stated contain 125 milligrams of Phenoxymethylpenicillin in the form of the free acid or an equivalent amount of the Calcium or Potassium salts, (125 milligrams are approximately equivalent to 200,000 units of penicillin). Like benzylpenicillin this compound is produced by the growth of *Penicillin Notatum* or related organisms under appropriate conditions followed by purification. It contains not less than 95·0 per cent. of total penicillins and not less than 90·0 per cent. of phenoxymethylpenicillin. When administered orally it is much more resistant to inactivation by gastric juice than is benzylpenicillin. The B.P., 1958, prescribed a micro-biological assay for total penicillins, but the B.P. Addendum, 1960, has amended this to a chemical iodometric assay. Identification and determination of the amount of actual phenoxymethylpenicillin is carried out spectrophotometrically by measuring the extinction at 268 mμ.

Included among other preparations of penicillin in the British Pharmaceutical Codex are Buffered Penicillin Solution-tablets and Penicillin Lozenges. The former contain 15,000 units of benzylpenicillin and half a grain of sodium citrate in each tablet. These tablets should not be used for preparing injections and they are intended for use in dispensing preparations for external use. Stored under cool conditions in sealed containers (to exclude moisture) they do not deteriorate as would a stored liquid preparation of benzylpenicillin and they are, therefore, convenient for dispensing purposes. Penicillin lozenges unless stated otherwise contain 1,000 units of benzylpenicillin per lozenge. They are used in the treatment of infections of the mouth but the B.P.C. states that they should not be used continuously for more than about two days.

During the year under review 18 samples were submitted for examination all by County Sampling Officers. Four of the samples were submitted as Penicillin Tablets B.P. (200,000 units per tablet), four as Penicillin V Tablets (125 milligrams per tablet), four as Penicillin V Tablets (60 milligrams per tablet), two as Benzathine Penicillin Tablets (200,000 units per tablet), two as Buffered Penicillin Solution-tablets and two as Penicillin Lozenges (1,000 units per lozenge). All the samples were obtained on prescription specifying the type and strength required. Three of the samples were reported upon adversely. Sample No.E.9304 was submitted as Penicillin V Tablets (125 milligrams per tablet), upon analysis, however, it was found to consist of Penicillin V 250 milligram tablets. The Pharmacist concerned was communicated with and cautioned with regard to the necessity of taking care when dispensing drugs. Sample No. S.1856 was submitted as Buffered

Penicillin Solution-tablets B.P.C. which should contain 15,000 units of benzylpenicillin per tablet. Upon analysis, however, the sample was found to consist of Penicillin V (125 milligram) tablets B.P. The latter tablets as already mentioned are approximately equivalent to 200,000 units of penicillin per tablet so that there was a very great difference in strength between those prescribed and those actually dispensed. The Pharmacist concerned stated that he had misunderstood the prescription and had not realised what was intended to be dispensed. The last unsatisfactory sample, No. S. 1857, was submitted as Penicillin Lozenges B.P.C. (1,000 units per lozenge). Upon examination, however, they were found to contain only 605 units of benzylpenicillin per lozenge whereas the B.P.C. standard requires that the potency should be not less than 90·0 per cent. of the prescribed number of units, corresponding in this case to a minimum of 900 units. The manufacturers of the lozenges were communicated with and informed of the code number on the container in order that the result obtained could be investigated and the age of the product ascertained. It transpired that the lozenges were made in November, 1961, and it had been expected that they would retain their potency for two years, particularly as approximately 1,300 units per lozenge had been included at the time of manufacture to compensate for any loss on storage. This sample was purchased in November of the year under review and had, therefore, not kept its potency of even half the expected period. The manufacturers examined their corresponding batch reference samples and found that these had also deteriorated to a similar extent. The reference samples still had moisture contents of less than 0·15 per cent. but in view of the results obtained the manufacturers took steps to withdraw all stocks from sale. They also stated that they would give further consideration to the question of the shelf life of this product.

TEETHING AND COOLING POWDERS

Prior to the year 1954 many of the above infant powders contained, as active ingredient, either calomel (mercurous chloride) or grey powder (a mixture of metallic mercury and chalk). During the period 1953 to 1955, however, there were four inquests on infants at each of which it was recorded that death was due to Pink disease caused by mercury ingested in the form of calomel teething powders or grey powder. The 1954 edition of the British Pharmaceutical Codex stated that there was some evidence that mercurial aperients played a part in the causation of acrodynia in infants and that they should not be given frequently. About this time also child welfare centres stopped issuing powders containing mercury and warned mothers of their possible danger if

given repeatedly without medical supervision. Grey powder was deleted from the British Pharmacopoeia, 1953, and calomel was deleted from the 1958 edition of the pharmacopoeia. Grey powder has also been deleted from the 1959 B.P.C. but calomel is still retained, with the warning, however, that it should never be given to infants.

In view of the risk of mercurial poisoning, manufacturers of teething powders stopped using any form of mercury about the time of the inquests referred to above and, wherever they could be traced, existing stocks of powders were withdrawn from sale. The ingredients of present day infant powders may include such substances as magnesium carbonate, magnesium oxide, phenolphthalein, etc. Two other substances which were, for a short time, used as ingredients following the discontinuation of mercurials were potassium chlorate and bromvaletone. Potassium chlorate, if used for more than very short periods, may cause haemolytic anaemia and methaemoglobinaemia and its use was discontinued in teething powders about the year 1957. Bromvaletone is a hypnotic of low toxicity which acts by inducing sleep. In 1960 it was added to the Fourth Schedule of the Poisons Rules made under the Pharmacy and Poisons Act and preparations containing it may now no longer be obtained except on prescription.

During the year 1962 nine samples of teething powders were submitted, all by County Sampling Officers. With one exception the samples were found to be satisfactory. Informal Sample No. C.9352 consisted of 7 teething powders which were in plain wrappers and which upon analysis were found to each contain approximately 29 milligrams of calomel (mercurous chloride). The dose of calomel given in the B.P.C. 1959 is 30 to 200 milligrams but, as already stated, there is also a warning in the B.P.C. that it should never be given to infants. The pharmacist concerned was communicated with and his attention directed to the above warning. He stated that the powders had been made up in his family business for many years but in view of this matter having been drawn to his attention he had immediately withdrawn his stock from sale.

BORIC ACID LINT

Boric acid lint is the subject of a monograph in the British Pharmaceutical Codex, 1959. It is absorbent cotton lint which has been impregnated with boric acid. The B.P.C. requires it to contain from 3·0 to 7·0 per cent. of boric acid and to pass an absorbency test. An official method of assay for boric acid content is also prescribed. During the year under review a total of 22 samples were submitted,

20 by County Sampling Officers and two by Autonomous Food and Drugs Authorities. The labels on 21 of the samples described them as being of B.P.C. quality, the remaining sample while not labelled B.P.C. did, in fact, comply with the B.P.C. requirements. Four of the samples, all County, were reported upon adversely. Informal sample No. C.7544, was a one ounce packet of boric lint which upon analysis was found to contain only 1·3 per cent. of boric acid as compared with the B.P.C. minimum limit of 3·0 per cent. The sample had been in stock for approximately two and a half years so that the manufacturers were unable to state definitely the cause of the deficiency but they suspected that it might have been cut from the end of a roll of lint which had not been completely impregnated. The remainder of the stock was withdrawn from sale. Informal sample No. C.7697, also consisted of a one ounce packet and this was found to contain only 1·6 per cent. of boric acid. The manufacturers, in this instance, suggested a similar reason for the deficiency as mentioned in regard to the previous sample. They also suggested that in preparing and handling small packets of lint some loss of boric acid will occur due to the powder simply falling out of the lint, although under ordinary circumstances this loss should be only slight. Informal sample No. C.7780, represented another one ounce packet which upon analysis only yielded 2·1 per cent. boric acid. This product had been supplied to the retailer by a firm who had purchased it in bulk form from the actual manufacturers as being of B.P.C. quality and had then cut and packaged it without checking its composition by analysis. The remainder of the retailer's stock was withdrawn from sale, analysed by the supplier and found to have a similar composition to the sample examined in the County Laboratory. As the result of this investigation the suppliers now carry out their own laboratory tests of goods purchased from other manufacturers. The last unsatisfactory sample, No. C.7795, also consisted of a packet labelled to contain one ounce net. The boric acid content was found to be satisfactory but the net weight of the contents of the packet was actually only five-sixths of an ounce. The deficiency in weight was brought to the attention of the County Chief Weights and Measures Inspector.

PROSECUTIONS

When the adulteration of a sample is considered to be sufficiently serious, legal proceedings are instituted. Prosecution, however, is only one of the means of dealing with adulterated or otherwise unsatisfactory samples. A perusal of tables 10 and 21, which are concerned with the various types of milk adulteration and sophisticated samples other than

milk, respectively, shows that many of the samples are only slightly adulterated. In the case of food and drug samples, other than milk, deterioration may be due to long storage or adulteration may be brought about by the action of some person other than the actual vendor. In these instances it is often considered appropriate to take less drastic action than legal proceedings. In the case of milk samples vendors are sometimes cautioned and subsequent samples then frequently prove to be genuine; in other instances dairies are visited by the Sampling Officers in order to correct faulty dairy management which has given rise to unsatisfactory samples. In the case of other foods and drugs appropriate action may take the form of the surrender for destruction of the remainder of any unsatisfactory stocks, returning stocks to manufacturers or communicating with packers with regard to unsatisfactory labels, etc.

During the year a total of 334 County food and drugs samples were reported upon adversely and in respect of 32 of these prosecutions were instituted, 21 in respect of milk samples, five in respect of samples containing extraneous matter (including one milk sample), five containing insects and one containing a prohibited colour. There were 32 convictions or orders to pay costs. The total fines and costs during the year amounted to £363.16.0. In table 23 will be found similar information for the years 1912 to 1962 inclusive.

Table 23
County Fines and Costs during the Years 1912-1962

YEAR	Number of Prosecutions	Convicted or ordered to pay costs	Dismissals, etc.	Fines and Costs		
				£	s.	d.
1912-1935 ...	1,504	1,302	202	6,239	1	7
1936	22	20	2	107	14	9
1937	39	36	3	165	1	0
1938	26	24	2	132	10	1
1939	19	18	1	100	11	6
1940	25	23	2	171	14	0
1941	84	79	5	824	13	2
1942	38	36	2	502	4	10
1943	54	49	5	375	10	11
1944	38	37	1	291	19	6
1945	33	33	0	365	4	6
1946	94	92	2	936	7	9
1947	98	93	5	667	7	0
1948	70	69	1	703	0	6
1949	48	45	3	518	17	2
1950	43	42	1	405	8	7
1951	50	39	11	362	11	6
1952	65	64	1	620	13	0
1953	54	53	1	576	12	8
1954	45	45	0	294	9	6
1955	42	41	1	261	7	6
1956	20	19	1	185	13	6
1957	21	18	3	371	1	0*
1958	27	26	1	270	4	7
1959	17	17	0	279	13	0
1960	16	16	0	232	14	0
1961	30	30	0	350	5	2
1962	32	32	0	363	16	0
Total ...	2,654	2,398	256	16,676	8	3

*Includes £105 costs ordered by the Divisional Court resulting from an appeal by way of case stated in respect of Sample No. M.7500 and a fine of £2 and £7 costs on the case being referred back to the Magistrates' Court.

Table 24

Prosecutions arising out of Samples obtained during the year 1962

District	Number of Prosecutions	Convicted or ordered to pay costs	Dismissals, etc.	Fines and Costs		
				£	s.	d.
Blackburn R.D.C. ...	1	1	—	10	0	0
Burnley R.D.C. ...	6	6	—	41	1	0
Chorley R.D.C. ...	5	5	—	23	0	0
Denton U.D.C. ...	1	1	—	21	0	0
Fylde R.D.C. ...	7	7	—	36	15	0
Heywood Borough ...	1	1	—	9	7	0
Horwich U.D.C....	1	1	—	33	8	0
Kirkby U.D.C. ...	1	1	—	18	2	0
Lytham St. Annes Borough ...	1	1	—	11	6	0
Padiham U.D.C. ...	1	1	—	27	7	0
Rawtenstall Borough ...	3	3	—	36	0	0
Thornton Cleveleys U.D.C....	1	1	—	34	9	0
Walton-le-Dale U.D.C.	2	2	—	39	14	0
West Lancs. R.D.C. ...	1	1	—	22	7	0
County Districts ...	32	32	—	363	16	0
Autonomous Authorities	4	4	—	45	15	3
Total—All Sources ...	36	36	—	409	11	3

PART II.—

THE MILK (SPECIAL DESIGNATION) REGULATIONS, 1960

*Phosphatase Test, Half-hour Methylene Blue Test and
Turbidity Test*

The above Regulations were made jointly by the Minister of Health and the Minister of Agriculture, Fisheries and Food. The Special Designations permitted by the Regulations are, for raw milk, “Tuberculin Tested” and, for heat-treated milk “Pasteurised,” “Sterilised” and “Tuberculin Tested Milk (Pasteurised).”

All producers’ licences are granted by the Minister of Agriculture, Fisheries and Food but since the 1st January, 1961, all dealers’ licences to sell milk, or heat-treated milk have, subject to certain exceptions, been granted by Food and Drugs Authorities.

The tests described in the Regulations are :—

The Clot-on-Boiling test for Tuberculin Tested Milk. This test applies to tuberculin tested milk in the possession of the licensed producer and will, therefore, only relate to samples taken by the Ministry. It is designed to show whether methods of production are satisfactory throughout the year and it indicates the end of the life of the milk whether due to souring or to sweet-curdling.

The Methylene Blue Test for Tuberculin Tested Milk (obtained from a dealer) and for Pasteurised Milk. This test indicates the probable quality of the milk at the time of its use by the consumer and it depends on the decolorisation of methylene blue by bacteria and reducing substances present in the milk. It is a half-hour test for both types of milk, whereas previously raw tuberculin tested milk was submitted to a $4\frac{1}{2}$ hour or $5\frac{1}{2}$ hour test depending on the time of year. The test is similar, but the conditions are more stringent, to the half-hour methylene blue test applied under the previous regulations to pasteurised milk. The test is designed to ensure that milk will keep fresh, if kept reasonably cool, until the next day’s supply is received by the consumer. With this end in view samples taken from 1st May to 31st October are kept at atmospheric shade temperature until 9.30 a.m. the following day. Samples taken from 1st November to 30th April inclusive are kept at atmospheric shade temperature until 5 p.m. on the day of sampling and then at a constant temperature of $65^{\circ}\text{F.} \pm 2^{\circ}\text{F.}$ until 9.30 a.m. the next day. The test with the methylene blue

solution is carried out for 30 minutes at between 37–38°C. and must be commenced between 9.30 and 10.0 a.m. on the day after the sample was taken.

If the atmospheric shade temperature at any time exceeds 70°F. the test shall not be applied. This a more realistic summer shade temperature than that in the previous regulations where 65°F. was the maximum limit for the storage temperature (pasteurised milk only). It was, in fact, found that the majority of samples passed the test even when the maximum shade temperature exceeded 65°F. but, because of the limit imposed, the tests had to be declared void.

The relationship between the clot-on-boiling and the methylene blue tests as applied to tuberculin tested milk is as follows. If the milk is in the hands of a producer or producer retailer the clot-on-boiling test applies, but if the milk has passed into the hands of a distributor the methylene blue test applies. If, therefore, a producer retailer sells part of the yield of his herd to a distributor the methylene blue test will apply to the latter part while the clot-on-boiling test will apply to the part he himself retails. The clot-on-boiling test is probably a more precise test for keeping quality as it is strictly temperature compensated. The methylene blue test is only partially temperature compensated and it depends on the reducing power of certain types of bacteria in milk rather than being a test of actual keeping quality. The methylene blue test could, however, be the more stringent test in instances where certain pathogenic organisms which rapidly reduce methylene blue are present.

The Phosphatase test for Pasteurised milk. This test indicates whether heat treatment has been adequate to destroy pathogenic organisms. The Aschaffenburg-Mullen phosphatase test is now used and it depends on the liberation by the enzyme phosphatase of p-Nitrophenol from the buffer-substrate solution. Phosphatase is always present in raw milk but it is almost entirely destroyed by the amount of heat treatment necessary for efficient pasteurisation. The test prescribed in the previous regulations was the Kay-Graham test which depends on the liberation of free phenol from the appropriate buffer-substrate solution.

The test now prescribed has several advantages. Incubation at 37°C. is only necessary for two hours instead of 24 hours. The test can, therefore, often be completed on the day of sampling. There is far less likelihood of incorrect results being obtained due to contamination with phenol or the presence of phenol-producing organisms in the milk, as p-

Nitrophenol is not in common use in a laboratory and is not produced by bacteria. It is only necessary, therefore, to carry out a blank and test the colour of the buffer-substrate solution for absence of free p-Nitrophenol, whereas previously it was also necessary to carry out a control test on each milk to check the absence of free phenol and phenol-producing organisms.

The test is satisfied by milk which gives a colour reading after incubation for two hours corresponding to the liberation of not more than 10 ug of p-Nitrophenol per ml. of milk. As a general guide to samples that fail the test it may be said that samples which show more than 10 and up to 18 ug are slightly under-pasteurised or contain a small quantity of raw milk (0·1–0·2 per cent.). Samples showing more than 18 and up to 42 ug are under-pasteurised or contain a small quantity of raw milk (up to 0·5 per cent.). Samples showing more than 42 ug are grossly under-pasteurised or contain an appreciable quantity of raw milk. Raw milk would give a colour equivalent to several thousand micrograms of p-Nitrophenol which would not be directly matchable.

The Turbidity test for Sterilised Milk. This test indicates whether sterilisation has been efficient and it is identical with that prescribed in the previous regulations. It depends on the fact that heating to not less than 212°F. for a period sufficient for effective sterilisation will also completely denature all the soluble protein of the milk. Samples which show the presence of soluble protein after submission to the test are insufficiently heated or contain raw milk.

The conditions for the heat treatment of milk prescribed in the Regulations are as follows :—Pasteurised milk must have been treated by one or the other of the following processes :—

(a) Retained at a temperature of not less than 145°F. and not more than 150°F. for at least 30 minutes and be immediately cooled to a temperature of not more than 50°F. ; or

(b) Retained at a temperature of not less than 161°F. for at least 15 seconds and be immediately cooled to a temperature of not more than 50°F. ; or

(c) Retained at such temperature for such period as may be specified by the licensing authority with the approval of the Minister.

Sterilised milk must have been filtered or clarified, homogenised and thereafter heated to and maintained at such a temperature, not

less than 212°F., for such a period as to ensure that it will comply with the turbidity test prescribed.

With regard to the taking of samples the Regulations state that these may be taken at any time when the milk is in the possession of the licensed producer, pasteuriser, steriliser or dealer. Unopened bottles shall be delivered intact as samples to the testing laboratory but where the milk is in containers exceeding one quart in capacity samples shall consist of not less than two fluid ounces of the milk and shall be taken, using aseptic precautions, from well below the surface of the milk and transferred to a sterile stoppered bottle. Instructions are given in the regulations with regard to the marking of samples and all samples shall be placed, immediately after taking, in an insulated container which shall not be artificially cooled and they shall be transported to the testing laboratory with the least possible delay. Samples must arrive at the laboratory on the day they were taken, otherwise they must be discarded.

The Milk (Special Designations) (Specified Areas) Orders, 1952 to 1962

The sequence of events since the year 1943, which has resulted in the making of a number of Milk (Special Designations) (Specified Areas) Orders, thereby prohibiting the sale for human consumption of raw undesignated milk in the areas specified, was given in some detail in this report for the year 1958. It is perhaps sufficient to say here that Section 37 of the Food and Drugs Act, 1955, makes it compulsory to use special designations in areas which have been made specified areas by orders made under Section 41 of the Act. The special designations which may be used in a specified area are "Tuberculin Tested," "Pasteurised," "Sterilised" and "Tuberculin Tested Milk (Pasteurised)."

The first Milk (Special Designations) (Specified Areas) Order which affected parts of the area of the County Food and Drugs Authority came into operation on the 1st November, 1952. Nine other Orders, similarly affecting parts of the County, have come into operation since. By the 10th April, 1961, all the 93 County districts in the County Food and Drugs Area had become specified areas. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows from the above that an increased number of samples of special designation heat-treated milks are now being taken by County Sampling Officers for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests.

During the year, 1,708 samples of milk were submitted for examination by the Phosphatase test, the Half-hour Methylene Blue test or by the Turbidity test. The samples were marked either Pasteurised, Tuberculin Tested (Pasteurised) or Sterilised and tables 25, 26 and 27 give particulars of the results obtained. Of the nine County samples which failed the Phosphatase test, two only were stated to have been taken at pasteurising plants. Eight County samples of heat treated milk failed to pass the Half-hour Methylene Blue test and of these also two were samples taken from pasteurising plants. That the majority of the samples failing this latter test should be from specified areas rather than samples taken at pasteurising plants is not surprising as there is obviously a greater possibility of older milk, of poorer keeping quality, being obtained from roundsmen rather than directly from processing plants. In addition, fourteen samples of tuberculin tested milk were submitted for examination by the Half-hour Methylene Blue test and on examination they were all found to be satisfactory.

Two samples sold as pasteurised milk, not shown in the following tables, were submitted by another Food and Drugs Authority and were found to consist of raw milk. A prosecution was instituted in respect of one of these samples under Section 2 of the Merchandise Marks Act, 1887 and the defenant was fined £1 and ordered to pay £4.15.3 costs.

Table 25

Phosphatase Tests, 1962

Type of Milk	Number Submitted	Number Unsatisfactory			
		Group 2	Group 3	Group 4	Total
Pasteurised	679	0	1	3	4
T.T. (Pasteurised) ...	679	2	2	1	5
Raw	0	0	0	0	0
Totals	1,358	2	3	4	9

Table 26
Half-hour Methylene Blue Tests, 1962

Type of Milk	Number Submitted	Number Unsatisfactory
Pasteurised	678	2
T.T. (Pasteurised) ...	682	6
Tuberculin Tested ...	14	0
Totals	1,374	8

Table 27
Turbidity Tests, 1962

Type of Milk	Number Submitted	Number Unsatisfactory
Sterilised	347	0

PART III.— THE FERTILISERS AND FEEDING STUFFS ACT, 1926

The Fertilisers and Feeding Stuffs Act, 1926, came into force on 1st July, 1928. It is intended to safeguard the purchasers of substances used for the fertilisation of the soil and for the feeding of cattle and poultry.

The general purpose of the Act, like that of the Act of 1906, which it repealed, is to provide civil remedies for the misdescription of, and to prevent fraud in, fertilisers and feeding stuffs. Its scope is defined by Regulations made by the Minister of Agriculture, Fisheries and Food.

In addition, Regulations were made by the Minister of Health during the years 1953, 1954 and 1958 (in exercise of powers first conferred by Section 2 of the Therapeutic Substances (Prevention of Misuse) Act, 1953, now replaced by Section 5 of the Therapeutic Substances Act, 1956), which permit the use of certain antibiotics, *viz.*, penicillin, aureomycin, streptomycin and oxytetracycline, in pig foods and poultry foods and for horticultural purposes. These Regulations prescribe conditions with regard to labelling and also specify in regard to pig and poultry foods maximum limits for the amounts of the prescribed antibiotics which may be present.

It has already been mentioned that the scope of the Fertilisers and Feeding Stuffs Act is defined by Regulations. The Regulations at present in force are the Fertilisers and Feeding Stuffs Regulations, 1960. These were made following a general review by the Standing Advisory Committee of the previous regulations, including the previously

prescribed methods of analysis. An amendment was made to the Regulations during the year under review in that the Fertilisers and Feeding Stuffs (Amendment) Regulations, 1962, now permit the third part of a sample taken by an official sampler or inspector under the Act to be sent to the appropriate person specified in the Regulations by the recorded delivery service as an alternative to registered post.

Fifty-two samples have been examined for the County during the year under review. Of these, 26 were fertilisers and 26 consisted of feeding stuffs. The fertilisers comprised 24 formal samples and two informal samples. All the feeding stuffs samples were formal.

In addition, 35 samples (13 formal and 22 informal) were examined for Autonomous Authorities. Of these 20 samples (two formal and 18 informal) were fertilisers and 15 (11 formal and four informal) consisted of feeding stuffs.

Of the 26 samples of fertilisers examined for the County 11 were found upon analysis to be correct within the limits of variation permitted by Regulations made under the Act, and 11 showed minor deviations outside the permitted limits of variation. The analytical results obtained on two of the remaining four samples showed differences from the declared figures which were, in the opinion of your analyst, to the prejudice of the purchaser. The formal sample of Hop Manure, No. 9/10/A, consisted of a moist mixture of spent hops and peat moss. It was not an article included in the First or Second Schedule to the Fertilisers and Feeding Stuffs Act and it was, therefore, outside the provisions of the Act. The article was marked in a manner similar to that required of a compound fertiliser, although as will be seen from table 28 the declared amounts were relatively small. Upon analysis the amounts of phosphoric acid soluble in water and of potash found were also very small as compared with the declared figures. These differences could have constituted an offence under the Merchandise Marks Act, 1887, as amended, and the compounder was cautioned in regard to both his method of manufacture and the markings applied to the commodity. The formal sample of Growmore Fertiliser, No. 45/2/A was found upon analysis to have a deficiency in potash content of 2·5 per cent., corresponding to a difference of 1·75 per cent. outside the permitted limits of variation. The sample also showed slight differences in respect of its phosphoric acid contents. Although the potash content was considered to be to the prejudice of the purchaser there was some doubt whether this sample was a truly representative one in view of the amount sampled and other relevant features of the sampling. No further action was taken in respect of this sample but a subsequent informal sample, No. 4/2/B, of the same manufacture was found to be correct within the limits of variation.

The formal sample of Raw Bone Meal, No. 8/10/A, contained only 19·5 per cent. of phosphoric acid. The fourth Schedule to the Act requires "bone meal" to contain not less than 20 per cent. phosphoric acid; this article should, therefore, have been described as "raw bone meal, Grade II." The packer was interviewed and he has given an undertaking that the quality of the product will be satisfactory in future. An informal sample of general purpose liquid fertiliser, No. 4/11/B, was found to be a mixed fertiliser as defined in the 4th Schedule of the Act, it should, therefore, have been marked with the appropriate analytical particulars required by Section 4 and the 1st Schedule to the Act. The sample had been purchased prepacked from a retailer and no declared analysis or statutory statement was available at the time of sampling. The manufacturers stated that they had overlooked the necessity of providing a statutory declaration but they had already been approached by another authority and supplementary labels were being supplied to their customers.

The eight formal samples of ground rock phosphate listed in table 28 were taken from material which had been stored for several months in the open for use on farms. In view of the conditions of storage the differences found in respect of phosphoric acid content were considered unlikely to be to the prejudice of the purchaser. In addition to phosphoric acid the Statutory Statement in respect of ground rock phosphate is required to contain a declaration of the amount that will pass through a prescribed sieve. In only two instances, Samples Nos. 41/6/A and 42/6/A, did the invoices contain this latter declaration and even these were not precisely in the form required, being declared as "Fines 15%" and "Finers 15%" respectively. The ground rock phosphate represented by these eight samples had all been supplied by one contractor who has been informed of the necessity of supplying purchasers with a statutory statement containing the analytical particulars required by the First Schedule to the Act.

Of the 26 samples of feeding stuffs examined for the County, 17 were found to be correct within the permitted limits of variation and eight showed only minor deviations outside the permitted limits. The remaining sample No. 37/7/A, High Yield Dairy Cubes, was found upon analysis to have a protein content of 16·8 per cent. as against 23·0 per cent. declared in the copy of particulars marked on the article. The difference was 6·2 per cent. and this was 3·9 per cent. more than allowed by the limits of variation. The sample also showed a slight deficiency in respect of its oil content. Your analyst was of the opinion that the deficiency found in respect of protein was to the prejudice of the purchaser and, with the consent of the Minister of Agriculture, Fisheries and Food, legal proceedings, under Section 4 (3) of the Fertilisers and Feeding Stuffs Act, 1926, were instituted against the

manufacturers. At the hearing of the case the defendant company pleaded “ guilty ” and was fined £10 together with £6.6.0 costs.

The analytical results of all the County samples examined during the year, together with the guaranteed figures contained in the Statutory Statements, are given in the following two tables.

Table 28
Fertilisers

[illegible]

Table 28—continued.

- G—Guaranteed.
F—Found.
- A — Found Moisture 80·5%.
- B — Moisture 10·4% ; Phosphoric Acid on the dry matter 32·5% ; amount that will pass through a prescribed sieve 1·8%. No copy of Statutory Statement provided.
- C — Moisture 10·5% ; Phosphoric Acid on the dry matter 31·4% ; Amount that will pass through a prescribed sieve 2·4%. No copy of Statutory Statement provided.
- D — Moisture 10·7% ; Phosphoric Acid on the dry matter 31·6% ; Amount that will pass through a prescribed sieve 1·4%. No copy of Statutory Statement provided.
- E — Moisture 9·5% ; Phosphoric Acid on the dry matter 32·1% ; Amount that will pass through a prescribed sieve 1·3%. No copy of Statutory Statement provided.
- F — Moisture 10·6% ; Phosphoric Acid on the dry matter 31·9% ; Amount that will pass through a prescribed sieve 1·4%. No declaration in Copy of Warranty of the amount that will pass through a prescribed sieve.
- G — Moisture 10·4% ; Phosphoric Acid on the dry matter 32·1% ; Amount that will pass through a prescribed sieve 1·9%. No copy of Statutory Statement provided.
- H — Moisture 9·6% ; Phosphoric Acid on the dry matter 32·0% ; Amount that will pass through a prescribed sieve 1·6% ; declared as “ 15% Fines ” in Copy of Warranty.
- I — Moisture 10·1% ; Phosphoric Acid on the dry matter 31·6% ; Amount that will pass through a prescribed sieve 1·5% ; declared as “ 15% Finers ” in Copy of Warranty.
- J — Guaranteed Carbonate of Lime 35·0%. Found Carbonate of Lime 35·5%.
- K — Found Acidity as H₂SO₄ 0·017%.
- L — Guaranteed Carbonate of Lime 35·0%. Found Carbonate of Lime 35·1%.
- M — Found Acidity as H₂SO₄ 0·020%.

Table 29
Feeding Stuffs

Sample Number District and Description	Formal or In- formal	Per cent. Oil		Per cent. Protein		Per cent. Fibre		Other Figures per cent.
		G	F	G	F	G	F	
31/3/A Kirkham Indian Meal	F						1·9	A
32/3/A Kirkham Pig Graders Meal ...	F	3·5	2·85	12·5	13·25	6·0	4·3	
28/5/A Hr. Blackburn Sow and Weaner Meal	F	2·7	3·7	15·35	15·5	3·4	6·3	
29/5/A Hr. Blackburn Layers Mash	F	4·0	4·6	16·0	16·4	6·0	5·3	
21/12/A Warrington Dairy Meal	F	4·0	3·9	19·0	21·4	5·0	4·1	
22/12/A Warrington Pig Fattening	F	2·5	3·6	14·0	13·5	5·5	3·7	
10/10/A Seaforth High Vitamin Breeder's Meal	F	3·0	2·7	18·0	15·9	4·0	3·0	
11/10/A Seaforth High Performance Laying Meal	F	3·0	2·9	17·0	16·9	3·5	3·5	

Table 29—continued

Sample Number District and Description	Formal or In- formal	Per cent. Oil		Per cent. Protein		Per cent. Fibre		Other Figures per cent.
		G	F	G	F	G	F	
43/6/A Leyland Sow and Weaner Meal	F	3·0	3·1	17·5	15·45	5·5	5·5	
44/6/A Leyland Battery Mash ...	F	3·0	2·8	17·5	17·0	6·0	4·5	
35/7/A Bury Chick Rearing Mash ...	F	3·5	3·9	16·0	16·7	5·5	3·3	
36/7/A Bury Sow and Weaner Meal	F	3·0	2·9	16·0	16·8	5·5	4·8	
39/4/A Lr. Blackburn Baby Chick Mash ...	F	4·0	3·8	20·5	19·3	5·0	3·8	
40/4/A Lr. Blackburn Pig Fattening Meal ...	F	2·5	3·9	12·0	12·7	4·5	4·0	
33/3/A Kirkham Breeders Mash ...	F	3·5	3·75	17·5	16·6	5·5	5·8	
34/3/A Kirkham Milk Ration ...	F	4·5	4·2	18·5	20·2	6·0	6·3	
41/9/A Manchester Maize Germ Meal ...	F	11·5	11·7	11·0	11·0	4·0	3·4	
42/9/A Manchester Millers Offals ...	F					8·0	6·6	B
12/10/A Seaforth Breeding Sow Meal ...	F	2·75	2·9	17·0	14·75	5·5	4·4	
13/10/A Seaforth Battery/Deep Litter Mash ...	F	3·0	2·9	17·0	15·4	5·0	4·0	
49/2/A Lonsdale Winter Layers Mash ...	F	3·6	3·5	17·5	15·9	5·0	3·9	
50/2/A Lonsdale 20% Dairy Ration ...	F	5·5	5·0	20·5	19·7	6·0	6·7	
37/7/A Bury High Yield Dairy Cubes ...	F	5·0	4·0	23·0	16·8	5·8	5·8	
38/7/A Bury Grain Balancer Mash ...	F	4·5	3·6	20·0	20·0	6·5	4·0	
45/6/A Leyland Chick Meal ...	F	3·5	3·5	18·0	18·1	5·5	4·5	
46/6/A Leyland Growers Meal ...	F	3·0	3·1	16·5	15·3	5·6	3·8	

A — Found Ash 1·4 and Sand and other silicious matter Nil.

B — Found Ash 4·6.

PART IV.—WATERS, EFFLUENTS, etc.

POTABLE WATERS

One hundred and twenty-two samples of water were examined during the year 1962 for suitability for drinking and domestic use. Twenty-seven of these were taken from dairies. Four samples were examined for fluorine only, and the remaining one hundred and eighteen samples were submitted for full sanitary analysis and are classified in the following table according to their source and organic purity.

*Table 30**Waters, 1962*

Source	Fit	Doubtful	Unfit	Total
Deep Well	32	5	0	37
Shallow Well	0	4	0	4
Spring	6	0	0	6
Upland Surface	42	15	1	58
Upland Surface mixed with Other Waters	2	2	0	4
Miscellaneous	5	4	0	9
Total	87	30	1	118

Sixty-five of the samples in the above table were taken from public supplies (9 deep well, 54 upland surface and 2 mixed waters). Eleven of these contained traces of nitrite, which in one case was also associated with a rather high free ammonia content. Somewhat high free ammonias occurred in three other public supply waters, and although pollution was less likely to have been responsible for these abnormalities than chemical treatment of the waters or reduction of nitrates by metal pipes, etc., special consideration of the bacteriological findings was recommended in every case. All other waters from public supplies were found to be organically satisfactory.

Twelve of the dairy water samples, used for general dairy purposes, were taken from supplies other than public supplies. Four were taken from a water lodge, four were spring water, and four were waters

re-circulated through pasteurising and sterilising plant. The lodge and spring waters all contained unnecessarily high doses of free chlorine but in view of the purposes for which they were intended no objection was taken to this. The re-circulated waters all contained faint traces of nitrites, probably resulting from reduction of nitrates by the metal-work of the plant, but special consideration of the bacteriological condition of the waters was advised in these cases.

Apart from the heavily chlorinated private sources of some of the dairy waters, other high figures for free chlorine were obtained only with waters sampled prior to distribution. These figures ranged from 0·33 part per million to 1·26 parts per million. Of waters as they issued from taps, the highest chlorine content recorded was 0·23 part per million, and the mean value found in tap waters containing free chlorine was 0·07 part per million. One hundred and seventeen samples were tested for chlorine and it was present in fifty of them.

The investigation of sources of supply of drinking water, with particular regard to treatment necessary, was conducted in 35 cases of which 33 were intended for subsequent public supply. These consisted of thirty-one samples from deep wells, one from a shallow well, one from a reservoir, one upland surface water, and one whose source was not stated.

Special enquiries or complaints were associated with twelve samples. Six were concerned with corrosive properties, one with discolouration of tea, one was taken in connection with a question of the effect of road widening upon a private water supply, and four stemmed from enquiries into the causes of stomach disorders. The water associated with the tea complaint was more alkaline than usual. In only one of the health enquiries might the water have contributed to the illnesses. In this case the water used was stored in open cisterns and contained an unsightly deposit of hydrated oxide of iron, vegetable matter, and atmospheric debris.

Twenty-eight of the 122 samples were submitted by the County Medical Officer of Health, 35 by the Makerfield Water Board, three by the Lune Valley Water Board, one by the County Surveyor, one for the information of the laboratory, and the others by the following Local Authorities :—City of Lancaster, 8 ; County Boroughs of Preston, 8 ; Southport, 4 ; Boroughs of Chorley, 3 ; Darwen, 12 ; Haslingden, 1 ; Leigh, 2 ; Morecambe, 1 ; Urban Districts of Formby, 1 ; Ramsbottom, 1 ; Standish with Langtree, 4 ; Thornton Cleveleys, 3 ; Tottington, 1 ; Urmston, 2 ; Rural Districts of Blackburn, 1 ; and Chorley, 2.

TOXIC METALS IN WATER

One hundred and seventeen of the samples of potable water submitted to the laboratory in 1962 were tested for lead, copper and zinc, and 116 were tested for iron.

The lead results are summarised in table 31.

Table 31

Lead parts per million	None detected	Less than 0·3	0·3 to 1·0	More than 1
Number of samples ...	111	1	4	1

The highest lead content found was 4·1 parts per million in a very acid water which had been standing overnight in lead pipes. Both the supply main and the plumbing inside the house were of lead. The four other waters which contained lead in excess of the usually accepted limit of 0·3 part per million were all acidic in reaction and were sampled from first drawn water in the morning. All were associated with lead plumbing, and one, in addition, was from a hot water system. Two results were obtained on the remaining sample which was found to contain lead, this water before entering the storage cistern contained 0·03 part per million of lead but the stored water, after passing through lead pipes, contained 0·12 part per million.

Thirty-nine samples contained traces of copper. The international standard for copper in drinking water is 1·0 part per million, but in 34 of the samples the amounts found were less than 0·3 part per million. Of the remainder, 0·5 part per million of copper was present in a sample which contained a deposit due to disturbances in the main ; 0·76 part per million was obtained from the hot water system of premises supplied with an acidic water ; levels as high as 2·8 and 1·8 parts per million respectively were found in two waters connected with a specific investigation into the corrosive nature of a supply ; in the remaining instance, a figure of 2·5 parts per million was obtained on a water which was conveyed in copper pipes along ducts which also carried hot water pipes. This water sample had not temporary hardness, and had a diminished dissolved oxygen content, which would suggest that it had reached quite an appreciable temperature before being sampled.

The usually accepted maximum limit for zinc is five parts per million, but the highest quantity of zinc found this year was only 2 parts per million. Five of the seven waters which contained traces of zinc contained amounts less than 1 part per million.

Iron was found in 115 of the 116 waters tested for it, and 46 of these contained quantities in excess of the 0.3 part per million usually regarded as the limit above which complaints of turbidity or staining may arise. Eighteen of these, however, were untreated waters and 8 others were from private lodges or springs and were required for special purposes. The results are summarised in table 32.

Table 32

Iron parts per million	Less than 0.1	0.1 to 0.3	0.31 to 1.0	1.1 to 5.0	5.1 to 10	More than 10
Number of samples	18	51	33	8	3	2

Only one sample, a treated water from a deep well, was found to be free from Iron. The highest Iron content found, 16.3 parts per million, was in an untreated well water, but the next highest at 11.6 parts per million, was in a tap water where disturbances in the main had brought insoluble oxides of Iron and manganese to the consumer. All the treated waters with Iron contents in excess of 1 part per million were associated with suspended matter, either as turbidities or deposits in the water.

Manganese was present, in insoluble form, to the extent of 26.4 parts per million in the water sample mentioned above which also contained Iron deposits. Insoluble manganese was also present in a trace of alumino ferric which had gained access to a treated water. In all the cases of untreated water, almost the whole of the manganese present was in soluble form even when iron was beginning to separate from solution. Thirty-six samples were examined for manganese, of which thirty-three were untreated waters. In only one of these was manganese absent and in the others it ranged from 0.03 part per million to 2.36 parts per million. The accepted limit for manganese in treated water is 0.1 part per million.

The four samples examined for fluoride contained from 0.03 to 0.06 part per million. The optimum and recommended amount of fluorine when waters are to be fluoridated as a prophylactic measure against dental caries is one part per million.

OTHER WATERS, EFFLUENTS, ETC.

Fifty-one samples were submitted under this heading.

Two effluents were examined for compliance with the standards of purity recommended by the Royal Commission on Sewage Disposal. Both were within the maximum limits of thirty parts per million for suspended solids, and twenty parts per million for Biochemical Oxygen Demand. One of these was associated with a sample of the filter-bed effluent from which it was derived, and it showed an improvement on this amounting to 54 per cent. reduction in suspended solids and 20 per cent. reduction in B.O.D.

B.O.D's of 2900 and 5700 were obtained on samples of liquid manure from piggeries.

Three samples of crude sewage were taken in connection with proposed extensions of sewage works. Two were weak sewage and one was of average strength. Three other crude sewage samples each consisted of weak sewage.

An under-floor water taken from a house was shown to consist of unoxidised sewage of average strength and the presence of anionic detergent tended to confirm the assumption that the source was domestic sewage.

An enquiry about water seeping into holes where concrete was to be laid revealed that the water contained more acid and sulphate than concrete could withstand.

Four enquiries were concerned with water being drunk by cattle. One water was for general market use, which included cattle drinking, and it was considered to be suitable for such purposes. One was water from a ditch near a completed refuse tip and this water was considered unlikely to be harmful to cattle. A water percolating through another tip contained considerable amounts of organic matter and iron, and a stream which cattle had used was found to have a B.O.D. higher than that recommended even for an effluent, and to have sewage fungus growing in it. The last two samples were reported as unsuitable.

Another biological enquiry arose from the death of fish in an ornamental park lake. The water was free from harmful chemicals and was found to correspond to the classification, "Clean to Very Clean." *Daphnia*, which are usually more susceptible to chemical poisoning

than most forms of aquatic life, survived quite well in it. One perch and five roach bodies were therefore recovered and brought to the laboratory and although the perch gills were affected by slime and parasitic Copepoda, the roach were only affected by Twinworm infestation at a level unlikely to have caused death. It was suggested that advice be sought from a University Biology Department which specialises in diseases of fish.

Finally, the one river water examined corresponded with the Royal Commission classification, "clean river water."

Thirty-one samples of swimming bath and sea bathing lake water were examined for compliance with the Ministry of Health Recommendations (pH should exceed 7 but should not exceed 8, and free chlorine should not be less than 0.2 part per million or much greater than 0.5 part per million). Only one sample failed to comply with the recommendation with respect to pH, this being from an open-air pool which had become acid. None of the samples complied strictly with the recommendation for chlorine content. The acid water from the above-mentioned open-air pool was devoid of chlorine and in six other cases deficiencies in chlorine content were noted. In all the remaining samples the chlorine residuals were higher than recommended. This is partly due to the fact that the Ministry recommendations were mainly concerned with a form of chlorination termed marginal chlorination in which the disinfecting action of a compound formed between the chlorine and ammonia in the water is accepted as effective over a period. Some swimming baths, however, attempt to destroy ammonia and organic matter as it arises, by using larger doses of chlorine. Also, at times of heavy bathing loads it is advisable to increase chlorine dosages in order to maintain a margin of free residual chlorine in addition to the chloramines formed with ammonia. Unfortunately, break-point chlorination, as the high dose treatment is called, needs almost constant supervision and periods of operation over and above the periods during which the bath is actually in use, so that the break-point condition is very hard to maintain when bathing loads are heavy. Advice appropriate to the state of the water and the process being used was, however, given in every case.

One sample of shallow well water was examined to determine whether it was suitable for use in a swimming pool. Since it showed some evidence of pollution it was advised that the supply be chlorinated before using it for bathing purposes.

PART V.—RADIOACTIVITY

Radioactivity determinations were commenced in September, 1958, and measurements have continued to be carried out each month of the year under review on samples of air, rainwater, tapwater and milk. Representative samples of other foodstuffs have also been examined to determine the level of contamination in this part of the country and to gain the necessary experience of the lengthy chemical and physical methods involved in the determination of very low levels of radioactivity.

There was an increase in the rate of fallout during the year under review. In the first half of the year, this was due to the slowly settling debris from the intensive Russian nuclear tests of September 1st to November 5th, 1961 and, in the second half, mainly due to a further series of Russian explosions. These started on the 5th August, 1962, and extended to the end of that year; they involved over 36 tests, a big proportion of which were in the multi-megaton range. Fallout from these tests, like those in the previous Autumn, arrived over this country before the concentration of isotopes with short half-lives had been greatly reduced by radioactive decay and one of these, iodine 131, again appeared in milk for a period of approximately 14 weeks. The activity of milk was however a little lower than that found in the latter part of 1961 this was possibly due to the lower rainfall in 1962. The Americans also carried out a series of atmospheric tests from April 25th to November 4th, 1962 but, due to their smaller size and to many of them being in the southern hemisphere, these only made a small contribution to the fallout measured in this country.

The amount of strontium 90 deposited by rainfall in 1962 was approximately 26 per cent. higher than in 1959, the previous peak year for fallout, but the deposition was spread out more evenly throughout the year and did not reach as high a spring peak as in the earlier year. The amounts of strontium 90 found in milk and upland surface mains tap water were slightly less than those found in 1959.

During the year under review 123 samples were examined for radioactivity, these were made up as follows :—Rainwater and deposits 12, air samples 44, vegetables 4, canned fish 1, shrimps 1, bone phosphate 2, dicalcium phosphate 1, baby food 4 and composite samples of milk 30, tapwater 16, flour 1, oats 1, school dinners 6.

RADIOACTIVITY OF AIR SAMPLES

Artificial radioactivity in the air was determined throughout the year by passing measured volumes through a paper thimble and determining the beta activity of the collected material after allowing sufficient time for natural activity to decay. Strontium 90 was later determined on combined deposits from several filters. The results are recorded in table 33. It will be seen that the total beta activity of the air samples declined steadily from an average of 2.6 units in January to 0.3 units during the middle of August. Due to the new Russian test series the total activity then began to increase again reaching approximately 4.5 units in November. The higher values at the beginning and end of the year were due to relatively harmless short lived isotopes. The highest amount of Strontium 90 was collected in the second quarter of the year. The average total beta activity for the air samples in 1962 was 1.66 picocuries per cubic metre and the average strontium 90 activity was 0.015 picocuries per cubic metre compared with the limits of 33 and 3.0 units respectively recommended for large populations.

Rainwater

An 18-inch square rain gauge on the roof of the County Laboratory was used to collect samples of rainwater and associated deposits. These were examined for total beta activity, strontium 89, strontium 90 and caesium 137. The results are shown in table 34. It will be seen that the activity of rainwater was at a relatively high level throughout the year under review. The total amount of strontium 90 collected in 1962 was 8220 picocuries per square yard compared with 1919 units in 1961 and 6520 units in 1959, the previous highest year for fallout. Strontium 89 is another radioactive isotope of strontium present in fallout; this has a half life of 51 days compared with 28 years for the more dangerous strontium 90. The ratio of strontium 89 to strontium 90 gives a rough guide as to the age of the fallout material. This ratio, which is approximately 185 for a fresh fission product mixture, decreases by approximately half every 51 days. The ratio of these two isotopes determined in rainwater is shown in table 34 and it will be seen that it decreases at the above rate for the first five months of 1962. It is only slightly higher than the expected ratio for June and July showing that at least up to the end of July, very little of the measured fallout was derived from the American tests which started on April 25th, 1962.

Drinking Water

Mains tap water from an upland surface gathering ground was also examined each month for total beta activity and several monthly samples

were combined for the determination of strontium 90. The results are recorded in table 35. It will be noted that the strontium 90 only amounted to a small percentage of the total beta activity due mainly to the presence of relatively harmless medium half-life isotopes. The average strontium 90 over the whole of 1962 was 0.73 picocuries per litre and was double the average for the previous year but a little less than the average of 0.75 units found for 1959. The International Commission's recommended maximum permissible concentration for strontium 90 in drinking water for large populations is 33 picocuries per litre. The corresponding limit for "fresh" mixed fission products in water is 1000 picocuries per litre.

Iodine 131 in Milk

This isotope, which has a half-life of 8.05 days is absorbed from the diet of animals. It is mainly concentrated in their thyroid glands but a significant amount appears in their milk. The risk from iodine 131 in cows' milk is likely to be limited to children under one year old. This is because the thyroid uptake of iodine is greatest at the age of six months and because the radioactivity is concentrated in their very small thyroid glands. As they grow older the size of the thyroid gland increases so that the iodine 131 is not so highly concentrated and the risk to older children, even those of one to five years is very much less.

The International Commission's recommended maximum permissible concentration for iodine 131 in water for large populations is 667 picocuries per litre and this could be tolerated for a period of years. The Medical Research Council decided that no special measures would be called for unless the average concentration of iodine 131 in milk were to reach 130 picocuries per litre averaged over a period of 12 months, or 260 picocuries per litre over six months and so on. This means that if the level on any day reached 130 picocuries per litre it would have to stay at that level for a whole year before the milk would reach the proposed limit. This level, which applies to the average obtained on the milk supply for the whole country, was set so as to give a margin of safety for the most vulnerable age group (children under one year) and for people in regions where the iodine 131 level is above average.

The intensity and geographical situation of the Russian 1962 series of tests which started on the 5th August were comparable (although a month earlier) with the 1961 series and, as would be expected, significant amounts of iodine 131 again appeared in fresh milk. The results

for iodine 131 determined in thirteen composite samples of milk are given in table 36. The maximum level found, calculated to the day the milk was purchased, was 86 picocuries per litre as compared with three values over 115 units obtained in 1961. The iodine 131 activity which first became significant in milk at the end of August and was present during September and October, fell away quickly after the middle of November when the cows were no longer out to pasture.

The average concentration of iodine 131 in milk found during the 13 weeks of sampling was 49 picocuries per litre as against the limit of 520 units for this period calculated from the Medical Research Council's standard.

STRONTIUM 90 IN FOODSTUFFS

Milk

Samples were examined regularly throughout the year because milk is known to be the principal food from which strontium 90 at present enters the diet of people in the United Kingdom and because it may form the sole diet of infants. The composite samples examined were obtained by taking an aliquot portion from each sample of heat-treated milk received in the laboratory for the regular bi-monthly testing of processing plants in the County area. The monthly turnover of these plants is approximately two million gallons and the composite samples obtained should be reasonably representative of the milk consumed in Lancashire.

The results obtained for strontium 90 and caesium 137 in the above-mentioned samples of milk are shown in table 37. The strontium 90 was relatively low in the first four months of the year when the cows were living mainly on hay and other stored food harvested before the 1961 tests. The activity rose quickly when grazing was resumed reaching a maximum of 18.3 picocuries per gram of calcium in September. The average concentration of strontium 90 in milk for 1962 was 10.7 picocuries per gramme of calcium as compared with 4.6 units in the previous year and 11.6 units in 1959.

The ratios of caesium 137 to strontium 90 found in the samples of milk varied from 4.4 to 6.8, compared with 1.38 found in rainwater, and were similar to the ratios found in previous years. The maximum permissible level for caesium 137 in food is approximately 200 times greater than that for strontium 90. It is, therefore, the concentration of the latter element which is radiologically the more significant.

School Meals

Sampling of school dinners was started during the year under review to obtain more information of the level of strontium 90 in a mixed diet after preparation and cooking losses. The results, each from a composite sample of dinners taken over five consecutive days and obtained from different schools, are shown in table 38. It will be seen from the last column that the strontium 90 activity in dinners plus mid-morning milk in September and November was double that found in March and May. The average weight of a meal varied greatly and depended on the age of the children and the type of meal but the percentage of calcium was close to 0.075 in all the samples. Over two-thirds of the calcium in the dinners was probably derived from the policy of adding separated milk powder at the rate of approximately three-quarters of an ounce per day per child. The level of strontium 90 in the dinners will also be influenced by its level of activity in milk at the time the milk powder was manufactured. The average strontium 90 in the thirty dinners samples from March to November was 15.2 picocuries per gramme of calcium or 13.8 picocuries per gramme of calcium for the dinner together with the one-third of a pint of fresh milk.

Other Foodstuffs

The results obtained for 1962 are listed in table 39. The potatoes bought in February (1961 crop) contained 25.2 picocuries of strontium 90 per gramme of calcium while the early potatoes from the 1962 crop, bought in August, showed 37.0 strontium units. Our figure previously reported for the 1960 main crop was 17.1 strontium units. These results for the edible part of potatoes reflect the steadily increasing strontium 90 content of the top soil.

The activity of the spring cabbage purchased in April was relatively high (54 strontium units) but a repeat sample from the same area obtained two months later was very much lower (22 S.U's) in spite of the higher rate of fallout in May and June. A large proportion of the activity from cabbage is due to deposition of fallout on the surface of the leaves rather than to absorption from the soil. The reduced activity of the summer sample was probably due to this cabbage having 'hearted' and thus having a lower proportion of outside leaves than the immature spring cabbage.

Cereal-based Infant Foods

In the report for last year it was noted that a composite sample made up of four brands of baby foods had been found to contain more

strontium 90 than expected and it was suspected that this could possibly be due to the use of bone calcium phosphate in two of the foods. Samples of each of these last mentioned foods were examined separately early in 1962 and their unusual strontium 90 content confirmed. Samples of the bone phosphate which had been used were also analysed and were found to contain 5080 and 5550 picocuries of strontium 90 per kilo. When used at the rate of 1.5 per cent. in the foods this ingredient would account for the strontium 90 content of the two samples of baby food over and above the levels expected from their other ingredients. It should be stressed that the amounts of strontium 90 found in these foods were not in any way dangerously high but it is felt that it is inadvisable to add an ingredient containing strontium 90 to an infant food when a suitable alternative free from strontium 90 is available in di-calcium phosphate which has been prepared from chalk. If the above products were used at the rate of one ounce per day together with three-quarters of a litre of fresh milk the strontium 90 level in the baby's diet would have been approximately 6.5 strontium units as against 4.4 strontium units without the bone phosphate and 4.2 strontium units on an all milk diet at the time of sampling (February 1962).

The results were brought to the attention of the two manufacturers concerned and it was pointed out that while the level of activity in these samples was acceptable, there could possibly be an appreciable increase in the strontium 90 content of the bones of grazing animals in the future. This activity would vary widely with the age of the animal, the region where it had lived, etc., and, unless the activity of each batch of animal bone phosphate could be checked, it would seem preferable to use chemically prepared di-calcium phosphate. It is of interest to note that two further samples of these same commodities purchased in November, showed a reduction in strontium 90 per kilo of 14 per cent. and 28 per cent. against the values found for the corresponding samples examined earlier in the year.

Cereals

The composite sample of oats gave a value of 36.4 strontium units corresponding to a small reduction when compared with the 41.0 and 39.0 strontium units found in 1961 and 1960 respectively. The composite sample of white flour showed the opposite trend, the strontium 90 activity being 4.9 picocuries per gramme of calcium compared with 3.0 strontium units and 2.5 strontium units in 1961 and 1960 respectively. These figures for flour would all have been five times higher if the samples had not also contained the compulsory amount of *creta praeparata* required by the Flour (Composition) Regulations, 1956.

Interpretation of Results

The picocurie (the alternative name for micromicrocurie was used in previous reports) is a measure of the activity of a radioactive isotope and is equivalent to that of one millionth of a millionth of a gramme of radium. In the case of strontium 90, one picocurie means that, on average, 2.22 atoms are breaking down per minute to give, with its daughter product yttrium 90, 4.44 beta particles per minute. Calcium and strontium are transferred from the diet to the bone in a relatively constant ratio, calcium, therefore, depresses the absorption of strontium by the skeleton. The amount of strontium deposited in the bone is determined by the ratio of strontium to calcium in the total diet and not by its content of strontium alone. In comparing diets or the effects of different foods, therefore, it is the strontium 90 to calcium ratio which is of importance; this ratio is conventionally expressed in terms of strontium units where one strontium unit is equal to one picocurie of strontium 90 per gramme of calcium.

From the results obtained in 1962 it can be estimated that the average adult diet over the year would have a strontium 90 to calcium ratio of approximately 11 strontium units (the 30 school dinners had an average of 15.2 strontium units). The body discriminates to some extent against strontium so that this element is absorbed at only one quarter of the rate for calcium. Thus a level of 11 strontium units in the diet will lead to 2.75 strontium units in the growing bone; this should be compared with the limit of 67 strontium units recommended as the maximum permissible body burden in large populations by the International Commission for Radiological Protection.

Table 33

Radioactivity Measurements on Air Samples

Sampling Period	Approximate Total Beta Activity	Determined Half-Life Fortnight after Collecting	Strontium 90
1962	Picocuries per Cubic Metre	Days	Picocuries per Cubic Metre
31st Dec. 1961—31st Jan. 1962	2.6	}	0.014 (Sr89=0.43)
1st Feb.—26th Feb. ...	1.8		
27th Feb.—26th March ...	1.4		
27th March—30th April ...	1.2	> 100	0.022 (Sr89=0.22)
1st May—25th May ...	1.0	> 100	
26th May—29th June ...	1.2	> 100	
30th June—8th July ...	0.9	> 100	0.013 (Sr89=0.054)
9th July—10th July ...	1.2	> 100	
11th July—13th July ...	0.5	> 100	
14th July—24th July ...	0.6	> 100	
25th July—7th Aug. ...	0.5	> 100	
8th Aug.—20th Aug. ...	0.3	> 100	
21st Aug.—24th Aug. ...	0.4	93	
25th Aug.—28th Aug. ...	0.6	60	
29th Aug.—3rd Sept. ...	0.9	76	
4th Sept.—7th Sept. ...	1.0	46	
8th Sept.—14th Sept. ...	1.3	30	
15th Sept.—21st Sept. ...	1.1	31	
22nd Sept.—28th Sept. ...	2.1	31	
29th Sept.—5th Oct. ...	1.5	42	0.011 (Sr89=0.33)
6th Oct.—12th Oct. ...	2.4	33	
13th Oct.—19th Oct. ...	2.4	33	
20th Oct.—26th Oct. ...	2.4	38	
27th Oct.—2nd Nov. ...	2.0	37	
3rd Nov.—9th Nov. ...	3.3	41	
10th Nov.—16th Nov. ...	4.9	23	
17th Nov.—26th Nov. ...	1.8	31	
27th Nov.—6th Dec. ...	4.3	30	
7th Dec.—18th Dec. ...	2.5	55	
19th Dec.—31st Dec. ...	2.7	35	
Average for whole year ...	1.66		0.015

Table 34

*Radioactivity of Rainwater and Deposit**Activity deposited per square yard*

Month	Rain-fall	Volume of Rain	Beta Activity of Acid Sol. Matter	Strontium 89	Strontium 90	Sr89 —— Sr90 Ratio	Caesium 137	Cs137 —— Sr90 Ratio
1962	Inches	Litres	Pico-curies (1)	Pico-curies	Pico-curies		Pico-curies	
Jan.	3·66	78·0	136,600	30,320	780	39	3,288	1·29
Feb.	2·44	52·0	113,800	20,320	660	31		
Mar.	1·06	22·6	44,400	4,840	250	19		
April	3·67	78·1	98,100	13,380	968	14		
May	2·95	62·8	107,800	8,720	960	9·1	2,344	1·48
June	1·38	29·4	62,100	3,910	616	6·3		
July	1·65	35·0	57,100	2,760	676	4·1		
Aug.	7·00	149·9	100,100	5,240	912	5·8		
Sept.	4·95	105·3	98,900	11,040	824	13	3,392	1·41
Oct.	2·24	47·6	51,400	9,440	348	27		
Nov.	1·26	26·8	56,400	9,610	306	31		
Dec.	2·74	58·4	74,100	27,520	920	30		
Totals	35·00	745·9			8,220			Av. 1·38

(1) Activity as measured at the end of each month in a liquid counter standardised with Sr90—Y90 and no correction for decay.

Table 35

Radioactivity of Mains Tap Water
(Upland Surface Gathering Ground)

Dates of Collecting Samples					Total Beta Activity (1)	Strontium 90
1962					Picocuries per litre (2)	Picocuries per litre
5, 11, 22, 29th	...	January	32.9	0.61 (Sr89 = 10.2)
13, 19, 20, 27th	...	February	...	...	58.8
8, 13, 21, 27th	...	March	...	...	40.7
5, 13, 19, 25th	...	April	51.8	0.71 (Sr89 = 4.2)
3, 9, 16, 23rd	...	May	...	...	29.6
7, 15, 20, 25th	...	June	...	...	30.2
4, 12, 19, 25th	...	July	28.4	0.86 (Sr89 = 2.7)
1, 7, 15, 21st	...	August	...	...	26.7
6, 13, 20, 25th	...	September	...	...	35.0
5, 9, 18, 25th	...	October	27.4	0.76 (Sr89 = 4.15)
5, 13, 20, 28th	...	November	...	...	29.6
3, 10, 19, 20th	...	December	...	...	37.0

(1) The natural potassium present has an activity of approximately 0.4 picocuries per litre.

(2) As measured in a liquid counter standardised with a Sr90-Y90 standard solution.

Table 36

Iodine 131 in Bulk Milk Samples

Date of Purchase of the Samples 1962	Number of Milks Sampled	Iodine 131 Picocuries per litre
6th Sept.	12	55
13th Sept.	21	68
17th Sept.	12	64
24th Sept.	16	30
1st Oct.	26	86
7th and 8th Oct.	20	78
16th Oct.	24	48
23rd Oct.	32	19
30th Oct.	42	43
6th Nov.	17	31
13th Nov.	22	59
19th Nov.	26	47
28th Nov.	23	6

Table 37

Radioactive Strontium and Caesium Isotopes in Milk

Month	Number of Milks Sampled	Strontium 89	Strontium 90		Caesium 137	Sr89 Sr90 Ratio
1962		Picocuries per gm. Ca.	Picocuries per gm. Ca.	Picocuries per kilo	Picocuries per kilo	
Jan.	227	9.7	4.3	4.9	21.3	2.3
Feb.	132					
March	96	7.7	5.0	5.7		1.5
April	153	8.2	5.2	5.9		1.6
May	208	68.5	9.2	10.3	53.0	7.4
June	96	62.0	13.2	14.5		4.7
July	194	53.0	15.1	16.3	111.0	3.5
Aug.	139	48.0	15.6	17.3		3.1
Sept.	93	77.0	16.0	18.3		4.8
Oct.	171	108.0	14.3	16.3	77	7.5
Nov.	164	81.1	13.2	14.9		6.1
Dec.	56	22.6	13.2	14.3		1.7

Table 38

Strontium 90 in School Meals

Date 1962	Average Weight of Meal	From Dinner per Day	From $\frac{1}{3}$ rd Pint of Milk calculated from Table 37	Total at School
Five consecutive School Days beginning	Gms.	Strontium Calcium 90 Gms. pico-curies	Strontium Calcium 90 Gms. pico-curies	Strontium Calcium 90 Gms. picocuries per gm. Ca.
26th March	526	0.376 4.2 (0.071%)	0.222 1.1	0.598 8.9
14th May	357	0.266 2.8 (0.075%)	0.222 2.0	0.488 9.8
18th June	273	0.240 3.2 (0.088%)	0.222 2.9	0.462 13.2
11th July	457	0.366 4.5 (0.080%)	0.222 3.35	0.588 13.3
24th Sept.	543	0.394 8.5 (0.073%)	0.222 3.6	0.616 19.6
20th Nov.	428	0.308 6.5 (0.072%)	0.222 2.9	0.530 17.7
Average	431	0.325 4.95 (0.075%)	0.222 2.6	0.547 13.8

Table 39

Strontium 90 in Foods, 1962

Lab. No.	Sample	Date Purchased	Calcium	Strontium 90	
				Picocuries per kilo	Picocuries per gm. calcium
R.365	Spring Cabbage, Lancashire Grown	26.4.62	0.147	79.0	54.0 (Sr89=418)
R.382	Cabbage Lancashire Grown	19.6.62	0.210	46.4	22.1 (Sr89=57)
R.338	Potatoes (4 samples)	1.2.62	0.0069	1.7	25.2
R.403	Potatoes (4 samples)	29.8.62	0.0045	1.65	37.0
R.450	White Flour (36 samples)	Feb. to Dec.	0.114 Approx. 0.092 added Ca.	5.6	4.9 (25.0 on natural Ca.)
R.454	Oats 12 Samples	1st and 3rd Qtr. of year.	0.055	20.0	36.4
R.345	Salmon, Canned	21.2.62	0.168	4.2	2.5
R.369	Shrimps (picked)	9.5.62	0.091	8.0	8.8
R.342 } R.429 }	Baby Food (Both same make)	7.2.62	0.662	78.2	11.8
		24.10.62	0.641	67.5	10.6
R.343 } R.430 }	Baby Food (Both same make)	8.2.62	0.575	104.7	18.2
		25.10.62	0.563	75.0	13.2

PART VI.—MISCELLANEOUS SAMPLES

This section of the report includes those samples which because of their nature or because of the circumstances under which they were obtained, could not be included in previous sections of the report. Three hundred-and-sixty-four samples were examined under this heading and they were submitted as follows : County Medical Officer of Health, 12; County Education Officer, 5; Chief Officer, County Fire Brigade, 3; County Architect, 3; County Chief Weights and Measures Inspector, 1; City of Lancaster, 39 ; County Borough of Preston, 92; County Borough of Southport, 15; Borough of Leigh, 41; Urban District of Formby, 12; Urban District of Urmston, 1; Urban District of Walton-le-Dale, 11; 129 samples were also examined for the information of the Laboratory. The work carried out on some of the more interesting of these samples is discussed in the following paragraphs.

ATMOSPHERIC POLLUTION

During the year 1962, 152 deposits and rainwater from soot gauges and 55 lead dioxide candles were analysed. These measurements were made on behalf of the County Borough of Preston, the County Borough of Southport, the City of Lancaster, the Borough of Leigh and the Urban Districts of Formby and Walton-le-Dale.

The standard soot deposit gauge consists of a large glass funnel of known area leading into a bottle large enough to hold a month's rainwater. The soot and water collected are brought into the laboratory at the end of each month for analysis, the minimum number of determinations carried out being those listed in table 40. The sulphur candles are porcelain cylinders of known area which are covered with a layer of lead dioxide prepared under standard conditions. This surface on exposure at the site, reacts chemically with sulphur gases present in the surrounding atmosphere and when it is examined at the end of the month its sulphate content is proportional to the average concentration of corrosive sulphur gases in the air at that point for the whole of the month. The City of Lancaster and the Borough of Leigh ceased to operate their lead dioxide instruments at the beginning of the year and changed over to the alternative volumetric apparatus which, although requiring daily attention locally, provides readings for each day for the sulphur gases and can simultaneously be used to determine the daily smoke concentration.

To illustrate the nature and magnitude of the results obtained in the examination of the contents of soot gauges the average monthly

figures for the three sites in the Borough of Leigh for the year 1962 are set out in table 40. The Manchester Road and Firs Maternity Home sites are approximately one mile to the East and West of the central Town Hall site respectively. The results obtained for soluble solids for the Manchester Road and Town Hall sites show an increase over the values found for any of the previous four years but they are not as high as the averages found for the first half of the last decade. The amounts of insoluble deposits found in the East and West gauges are not appreciably different from those for the previous four years but the Town Hall site shows a significant increase in insoluble solids. The insoluble deposit collected by this last gauge during the years 1958 to 1961 inclusive was 15·9, 14·5, 12·0 and 12·6 tons per sq. mile per month respectively so that this years' figure of 21·5 shows a disappointing swing back to the position prior to the year 1958.

Table 40

Soot Gauge Observations, 1962

Monthly Averages in Tons per Square Mile

Site	Borough of Leigh		
	Manchester Road	Town Hall	Firs Maternity Home
Rainfall in inches ...	2·61	2·45	2·56
Carbonaceous matter and Tar ...	2·26	7·07	3·52
Ash ...	5·24	14·40	4·86
Soluble Deposit ...	6·49	7·45	5·96
Total Deposit ...	13·99	28·92	14·34
pH. ...	4·10	4·05	4·08

* Insoluble deposit

The following miscellaneous samples may also prove of interest :—

Milk Bottle, Sample No. M.9327

This sample consisted of a one-third pint milk bottle which was empty when received except that the inside was stained with a film of dried milk and it also contained 2·965 grammes of broken glass. The

bottle itself was not in any way chipped or broken but most of the broken glass consisted of one triangular piece weighing 2.692 grammes which was of the same density (2.50) as the glass of the bottle itself. The piece of broken glass also showed part of the top rim and capping groove and it had clearly been part of the neck of a similar bottle to that submitted. The dairy concerned was cautioned.

Milk Bottle, Sample No. M.9631

This sample also consisted of a one-third pint milk bottle which contained traces of milk residues and some 12 small fragments or specks of broken glass. The rim of the neck of the bottle was broken and missing for approximately one-half inch but the fragments of glass inside the bottle were too small to match up against this gap although their density was identical with that of the bottle itself. In view of the doubt as to when this bottle had been broken no action was taken against the suppliers of the milk.

Part Insect, Sample No. M.9393

This consisted of the greater part of a beetle which was identified as a moorland dung beetle alleged to have been present in imported winberries used in a pie. The beetle was devoid of phosphatase which was consistent with it having previously been heated or included in a baked article. Beetles of this type have previously been found occasionally in bilberries and they probably crawl or fly into the collected bilberries while still on the moorland. They are similar in colour to bilberries but they are not beetles which infest stored food. The importers concerned were communicated with and they, in turn, drew this matter to the attention of the firm responsible for sending the bilberries into this country.

Part of an Ice Lolly, Sample No. M.9559

This sample had been returned to the vendor on complaint that it had a metallic taste. On examination it was found to contain 103 parts per million of copper. An informal food and drugs sample, No. S.1697, submitted from the same vendor's stock was also found to contain copper to the extent of 60 parts per million. While there are no statutory limits for copper in foods the limits recommended by the Food Standards Committee are 2 parts per million for beverages and

20 parts per million for other foods. Both samples, therefore, contained excessive amounts of copper and the matter was drawn to the attention of the Food and Drugs Authority in whose area the lollies had been manufactured. It transpired that the firm concerned had been using some moulds made of untinned copper and they were instructed not to use these again until they had been properly tinned.

Glass Washing Fluid Samples, No. M.9468 and M.9469

The second of the above samples consisted of a soapless detergent glass washing fluid submitted in the maker's original container; the constituents of this fluid were found upon analysis to include 7·5 per cent. of an anionic soapless detergent. Sample No. M.9648 on the other hand, was submitted in a bottle bearing a printed lime juice cordial label. This bottle was approximately half full when received and the liquid gave the following results upon analysis:—Total Sugars (as Invert Sugar) 27·4 per cent., Acidity (as Citric Acid) 1·7 per cent., Anionic Soapless Detergent 1·2 per cent., Colouring Matter, etc., 0·2 per cent. An informal food and drugs sample of this particular make of lime juice cordial was also submitted for analysis and a comparison of the results of the analysis of the three samples indicated that sample No. M.9468 consisted of a mixture of approximately 85 per cent. by weight of lime juice cordial with 15 per cent. by weight of the soapless detergent glass washing fluid. These analyses were undertaken as part of an investigation following the consumption on licensed premises of a drink which was alleged to have caused illness. The brewery company concerned was cautioned with regard to the necessity of taking better precautions in both the storage and use of glass washing fluid.

Preserving Pan, Sample No. M.9597

This pan was submitted for examination following the analysis for an Autonomous Food and Drugs Authority of a sample of home made plum jam which was alleged to have made people ill. The jam was found to contain 5·1 parts per million Lead, 75 parts per million Copper and 13 parts per million Zinc (the usually accepted maximum limit for these metals being 2, 20 and 50 parts per million respectively). The acidity of the jam was 1·09 per cent. calculated as citric acid, a figure which was a little higher than the normal range for jams which usually fall between 0·4 to 0·9 per cent. acidity. The remainder of the stock of this jam was surrendered and destroyed but in order to ascertain

the source of the metallic contamination the preserving pan used was submitted for examination. The pan was found to be of brass and besides copper and zinc the metal was found to include 3·7 per cent of lead. A small amount of lead is apparently added to some brasses to improve the machinability of the metal. The interior of the pan was not very clean and it was treated for one hour with 2 litres of hot 0·5 per cent. citric acid solution, the solution being concentrated by evaporation during this treatment to an acidity of approximately 1·1 per cent. The liquid was then removed from the pan and the whole treatment repeated with a fresh citric acid solution. Upon analysing the solutions, the first was found to contain 293 parts per million Lead, 350 parts per million Copper and 180 parts per million Zinc, while after the repeat treatment the second solution contained 12 parts per million Lead, 33 parts per million Copper and 15 parts per million Zinc. While this treatment is not directly comparable to jam making it does indicate what may happen when boiling acid fruits or in making lemon cheese or pickle in such a pan. Clean copper pans or, better, stainless steel pans are less readily attacked than brass.

Chemical Waste Liquor, Sample No. M.9304

This sample was submitted by the Chief Public Health Inspector of a County District following complaints of offensive odours arising from a place where industrial waste was being deposited. The liquor was found upon analysis to consist of a solution of sodium hydrosulphide and sodium monosulphide together with small amounts of polysulphides and other sulphur compounds. It yielded upon acidification 6·4 per cent by weight of sulphuretted hydrogen. Following this investigation an assurance was given that no further quantities of this material would be deposited and steps were taken to destroy the existing deposits.

Electric Kettle Sample No. M.9625

This aluminium kettle was submitted by an Autonomous Food and Drugs Authority following complaints of an unsightly green and black deposit forming in the kettle. The deposit was green on the inside of the kettle but black on the hot parts of the internal element. The deposit proved to be mainly a deposit of calcium carbonate from a hard water and it was discoloured by copper compounds. The amount of copper present in the scale was 2·1 per cent. (as CuO) and it was found that the green deposit from the inside walls of the kettle could be turned black by gently heating it as would happen to the scale on the metal

of the heating element. This discoloured deposit was caused by filling the bottle with water, probably hot water, which had stood in copper water pipes and in the copper hot water cylinder. The complainant was advised that water from the hot water supply should never be put into an aluminium kettle.

Veterinary Medicine, Sample No. M.9539

This sample was submitted by the Chief Inspector of Weights and Measures in order to ascertain whether it came within the provisions of the Pharmacy and Poisons Act, 1933. Upon analysis it was found to contain 4.4 per cent. sugar, 0.18 per cent. calcium phosphate, 0.03 per cent. creosote obtained from wood and 0.02 per cent. quinine. It was reported that substances containing less than 50 per cent. of creosote obtained from wood are exempted from the provisions of the Pharmacy and Poisons Act by the 3rd Schedule of the Poisons Rules 1960 and that Quinine is not a substance included in either Part I or Part II of the Second Schedule of the Poisons List Order, 1961. The medicine did not, therefore, come within the provisions of the Pharmacy and Poisons Act.

In connection with the co-ordinated purchasing scheme and the placing of contracts, a sample of rose hip syrup was examined for the County Medical Officer of Health in order to confirm that deliveries were of similar composition to the sample previously submitted under tender. A bottle of cod liver oil from a supply under the Welfare Foods Scheme, which was some three years old and which was showing a little gumming at the surface of the oil, still complied with the declaration of Vitamin A potency on the label and the acid value of the oil was still little more than half of the maximum limit laid down by the British Pharmacopoeia. A part sack of spray dried separated milk powder from a school meals kitchen was found to contain brown particles of overheated milk powder to the extent of 0.02 per cent. Good quality milk powder should not contain overheated milk particles and the suppliers had previously agreed to replace any milk powder so affected. Only one sack of the delivery was unsatisfactory. Three samples of anti-freeze solution for use in the cooling systems of motor vehicles were examined for the Chief Fire Officer in order to ascertain whether they conformed to the requirements of British Standard Specification 3151 : 1959 for Type B Anti-Freeze (Sodium Benzoate and Sodium Nitrite Inhibited). Two of the samples had been submitted with tenders and one of these was found not to be Type B Anti-Freeze ; the other sample and a sample taken subsequently from bulk stock

both complied with the requirements of the specification. Two samples of concreting sand and a sample of limestone were submitted by the County Architect in order to ascertain their suitability for use in building operations. A sample of roast beef from a School Meals Kitchen was submitted by the Chief Education Officer in order to ascertain the cause of a green iridescence shown by slices of the meat. The meat was sound, freshly roasted and was found to be free from artificial colouring matter. A portion submitted to the Regional Public Health Laboratory was found to be free from pathogenic organisms. The meat had, however, been treated with salt before roasting, the salt content being between 0·5 to 1·5 per cent. whereas meat itself gives a figure of only approximately 0·15 per cent. Salt contamination can itself give rise to colours in meat but sea-water or fish contamination in a cold room or refrigerator can also give rise to a growth of *Pseudomonas Phosphorescens*. This bacteria is widely distributed and is resistant to chilling-room temperatures; it will create iridescent colours in meat but it could not be isolated from this particular meat, which had, of course, been cooked. Lastly, two samples of sausage and two samples of sausage meat for supply to School Meals Kitchens were also submitted by the Chief Education Officer in order to ascertain whether their composition complied with the County Council Specification. Three of the samples were found to comply with the requirements of the specification, while the remaining sample, which had a satisfactory total meat content, was found to contain slightly more fat than the specification permits.

